ATTITUDES OF GIRLS TOWARDS LEARNING SCIENCE SUBJECTS IN TANZANIA SECONDARY SCHOOLS: A CASE OF SECONDARY SCHOOLS IN SUMBAWANGA MUNICIPALITY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATIONAL IN ADMINISTRATION, PLANNING AND POLICY STUDIES (MED-APPS)

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CERTIFICATION

The signatory witnesses to having read and approved the following dissertation to the Open University of Tanzania: **"The Attitude of Girls Toward Learning Science Subjects in Secondary Schools in Tanzania; The Case of Sumbawanga Municipal",** in partial completion of the requirements for the degree of Masters of Education in Administration, Planning, and Policy Studies of the Open University of Tanzania.

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Dr. Adam Namamba

(Supervisor)

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Date

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DECLARATION

I, Francisca Kayanda, declare that the work presented in this dissertation is original. It has never been presented to any other university or institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfillment of the requirement for the Degree of Master of Education in Administration, Planning and Policy Studies (MED-APPS) of the Open University of Tanzania

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Signature

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Date

DEDICATION

I dedicate this dissertation to my family members, especially my sons Victor, Paul, and Francis, and my daughter Adella, who have been supportive and encouraging. I hope they will be inspired by my work one day.

ACKNOWLEDGEMENT

I would like to express my gratitude and thanks to the heavenly creator, who gave me strength, guided me along the path, and ultimately enabled me to complete the MED-APPS program. His name is well known. Second, I would like to express much appreciation and gratitude for the tireless guidance, patience, criticism, moral, and emotional support provided by my supervisor, Dr. Adam Namamba, from the Faculty of Education at the Open University of Tanzania, for his continuous encouragement and constructive supervision from proposal writing to the completion of this research. This study would not exist in the way it is without his consistent direction and critique. He was always accessible for consultation and assistance, and I appreciate his willingness to fulfill my guiding needs. I would certainly want to express my heartfelt gratitude to him.

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ABSTRACT

The study assessed girls' attitudes towards learning science subjects in Tanzania's secondary schools. The main specific objectives were to examine girls' preferences for science and other subjects, to assess the attitude of girl students and to find out the challenges facing the girl student when learning science subjects in Sumbawanga Municipal secondary schools. Both qualitative and quantitative methods were used in the study. The sample was selected by using both Purposive and Simple Random Sampling Techniques. The data collection methods included; Interview; data collection Instruments, Focus group discussion and Observation methods. Data were analysed using both quantitative and qualitative techniques. The findings revealed that most girls prefer other subjects to science, referring it as a hard. Teachers had positive opinions about girls' ability to do science, but faced obstacles such as a shortage of science teachers. The majority of girls' experiences of science subjects were negative and this deterred them from taking science subjects although they were aware of its importance. The findings further revealed that lack of competent science teachers, lack of parental support, traditional gender roles, biological factors, and limited resources are other factors influencing girls' attitudes towards learning science subjects. The study recommends constructions of Dormitories for girl students, making all subjects compulsory, introducing strategies to change mindsets, employing competent science teachers, and educating the community to remove negative beliefs about science in order to improve the attitudes of girls towards learning science subjects.

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LIST OF ABBREVIATIONS

CSEE	National Certificate of Secondary Education Examination
CLEs	Classroom Learning Environment
DISEO	District Secondary Education Officer
ESDP	Education Sector Development Program
KPIs	Key Performance Indicators
KS2	Key Stage 2
KWLH	What we know, what we want to know, what we have leaned and how we know it
La MAP	La Main A la Pate
MCD	Ministry of Community Development
MoEST	Ministry of Education Science and Technology
MRC	Medical Research Council
MU	Mzumbe University
NCER	National Center for Education Research
NECTA	National Examination Council of Tanzania
NEPAD	New Partnership for Africa's Development
NGOs	Non -Governmental Organization
NSF	National Science Foundation
OUT	Open University of Tanzania
PISA	Programme for International Student Assessment
PQTR	Pupils Qualified Teachers Ratio
PSLE	Primary School Leaving Examination

PTR	Pupils Teachers Ratio
SEDP	Secondary Education Development Program
SATs	Standard Assessment Tasks
SEOC	Statistics from Equal Opportunity Commission
SESS	The Science Education in Secondary Schools
STEM	Science, Technology, Engineering, and Mathematics
SUA	Sokoine University of Agriculture
TRCs	Teachers Resources Centers
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UK	United Kingdom
URT	United Republic of Tanzania
US	United States
WEO	Ward Education Officer

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE PROBLEM

1.1 Introduction

This section presents the research background, problem statement, research objectives, research questions, research concepts, scope, research limitations, and conceptual framework.

1.2 Background to the Problem

Students from all over the world, regardless of gender, bring their cultural heritage to their education. They all had prior experience with science outside of the classroom and are capable of forming and expressing their own ideas. This indicates that students have positive attitudes about learning science subjects in school (Diamond, 2008). Gender segregation had improved in the past in subjects such as mathematics and other sciences. Boys were supposed to do well in logical and theoretical subjects like science and mathematics, while girls were thought to shine in art subjects like reading. The educational success gap among men and women is closing. However, the gap remains, and nations such as the United States, the United Kingdom, and Australia seem to have closed it (Beilock et al., 2009).

Research displays that, girls' poor performance in science remains a serious issue in Tanzania and all over the world. Most developed as well as developing nations face the difficult of girls' meager educational performance in science subjects, which provides a significant barrier to girls' access to higher education and occupation in science (URT, 2011).

Evidence shows that the issue of girls' declining academic performance in science subjects remains an important topic of discussion in Tanzania among teachers, politicians, administrators, parents, and all other sponsor groups. According to some reports, the academic performance of girls in science subjects in secondary schools has been constantly reduced. For instance, according to the 2017/2018 Ministry of Education and Vocational Training report, the academic performance of girls in science subjects decreased by 3.9% in physics, 5.7% in chemistry, and 15.2% in mathematics in the year 2016/2017 (URT, 2018).

The problematic of females' poor academic performance in science subjects is accepted as a product of Tanzania's educational system's failure to provide a conducive learning surroundings for girls to appreciate effective and quality education. Politics, poor educational policy, and insufficient teaching methods, for example, are frequently cited as obstacles to girls' poor educational achievement in science subjects (Kasimoto, 1997).

Additionally, negative parental opinions and a lack of understanding about the value of education for females, excessive housework, and society's message to girls that they are lousy at science subjects all contribute to girls' hindrance and limit our likely science teachers, doctors, engineers, designers, and computer scientists (Beilock et al., 2009).

The Tanzanian government is striving to implement suitable measures, such as increasing student textbooks to an average of one to one, constructing laboratories and libraries, increasing the amount of secondary schools by 1% from 3604 in 2017

to serve up to 3632 disadvantaged communities in 2018, and increasing enrollments at Sokoine (SUA) and Mzumbe (MU) public universities for teacher training in mathematics and science subjects. Priority hiring of graduate teachers in Bachelor of Science with Education (Mathematics and Science), supplying of capitation grants to secondary schools to increase education quality, and the primary objective of education in the twenty-first century is to produce scientifically literate people who can think for themselves and solve problems (URT, 2018).

Regardless of these efforts, a variety of difficulties have arisen, including low performance in secondary school examinations, majority of female students scoring a meager pass or failing totally in Form IV examinations, lack of competent science teachers, particularly in mathematics, girls' lack of interests in science subjects at all, inequality in the learning environment in different schools results in difference in education outcomes, an insufficient infrastructure, including several building projects that were started but were not finished under SEDP I, and because most schools lack or rarely use laboratories and libraries, students who should be taking science classes typically perform poorly. This meager performance has led to prevention condition and feelings of inferiority, and this is why most students, especially girls, choose to enroll in arts classes rather than science subjects. A poor teaching approach in the classroom because it is teacher-centered; no practice or demonstration; ineffective use of classroom time for student mental engagement; and a weak teacher incentive system have shown to weaken the performance of girls in science subjects and hence finally lacking interests in such science subjects (UNESCO, 2010).

Huruma (2015) increases that regardless of all efforts, it is presently noted that the goals of enhancing scientific literacy, especially for girl students, have not been attained, science registration is moderately low especially for girl students, success at higher educational levels is decreasing all these factors lower the science teachers' morale.

1.3 Statement of the Problem

According to recent data, the number of female and male students attracted in mathematics and science is nearly the same, however their performance is more favorable to boys (McCartney, 2016). Though, female do unwell in science subjects in the National Certificate of Secondary Education Examinations (CSEE). As a result, the number of girls enrolling in advanced-level secondary education declines dramatically, causing an imbalance that continues to the university levels. As a result, female candidates for science-based programmes at universities are limited (Kafanabo et al., 2017).

The level at which female students are releasing out of science subjects in Tanzania is waning, despite improved entrance to education for most Tanzanian children. Teachers add to a variety of issues, including unpreparedness for self-study, inadequate instructional techniques for teaching and learning, a lack of capacity for the science subject, a lack of government care, and the impact of other groups, including parents, role models, instructors, and peers (Salim, 2012).

However, some findings indicate that in underdeveloped countries including; Tanzania, many girls avoid science subjects (URT, 1996). The condition is poorer in

rural areas, where insufficient science teaching and learning resources are an ongoing problem.

Girls' attitudes toward learning science subjects in Sumbawanga Municipality have not been scientifically investigated, despite the evidence showing that boys dominate girls in science subjects in most cases. This study intends to investigate the girls' attitudes towards learning science subjects in Sumbawanga Municipality.

Therefore, this study is an attempt to contribute to the improvement of science education among Sumbawanga Municipal students in order to satisfy the needs caused by global technological development and marketing competition, as well as social, environmental, and economic concerns. The study also contributes to the application of Tanzania's Vision 2025 for improved living, fairness of life, and the welfare of the nation and its societies by preparing a new age group of new individuals with greatly advanced problem-solving skills.

1.4 Research Objectives

1.4.1 General Objectives

The general objective of this study is to measure the attitudes of girl students toward learning science subjects.

1.4.1 Specific Objectives

The particular aims indicated below led to this research.

i. To examine girls' preferences for science and other subjects in Sumbawanga Municipal secondary schools

ii. To assess the attitudes of girl students in Sumbawanga Municipal secondary schools towards learning science subjects

iii. To find out the challenges facing the secondary school girls when learning science subjects in Sumbawanga Municipality

1.5 Research Questions

i. What are the preferences of secondary school girls between Science subjects and other subjects in Sumbawanga Municipal?

ii. What are the attitudes of secondary school girls in Sumbawanga Municipality towards learning science subjects?

iii. What challenges do secondary school girls in Sumbawanga Municipality face when learning science subjects?

1.6 Significance of the Study

The findings of the study intended to assist education administrators, such as heads of schools, district education officers, school quality assurance officers, teachers, students, and other educational stakeholders, in understanding the attitudes and problems that prevent girl students from taking science subjects in their studies. Therefore, the understanding would help to identify educational tasks and the steps to be taken so as to alleviate the problems.

In such a situation, curriculum designers would be able to create gender-balanced curriculum content in terms of teaching methods, interaction patterns, and interests, all of which must be meaningfully related to students' prior experiences and the

world in which they live. Teachers and parents would be able to weigh their strengths in promoting girls to pursue science in light of the government's requirement for a scientific workforce in many social and economic sectors as a result of this research.

The study helps the Tanzanian government in decision-making and planning processes for policymakers, implementers, and other education stakeholders. Findings link field activity implementation to KPIs and identify what is going well, what needs improvement, and places for change. It also expands academics' understanding of subject selection, girls' concerns, and their relationships with academic progress in secondary schools.

1.7 Scope of the Study

This study examined the attitudes of girls in Tanzanian secondary schools about learning science subjects. It was held at Mazwi, Kizwite, Mafulala, and Kilimani secondary schools in Sumbawanga Municipality. Heads of school, academic teachers, Ward Educational Officers (WEO), District Secondary Education Officers (DSEO), teachers, parents, and students were included in the study population. Sumbawanga Municipal was picked since it has a large number of schools and students from different socioeconomic groups study there. The study involved only the community secondary schools. It did not involve the public secondary schools, private secondary schools and primary secondary schools. The target population of the study was the community secondary school girls with little information from the community secondary school boys for performance comparison.

1.8 Delimitations of the Study

Language barrier influenced the accuracy of responses questionnaire data. Because the majority of the parents were unable to express themselves in English, the researcher prepared questionnaire items in both English and Swahili. It was discovered that the majority of the students struggled to express themselves in English. The researcher's capacity to collect additional information was limited by this situation. As a result, the researcher opted to gather further material in Swahili.

The researcher expected to have 200 respondents in the sample; however, 14 did not participate. As a result, the researcher's population size remained with 186 (93%) respondents; however, this has no bearing on the study's validity.

Finally, the researcher took a long time to complete the study due to a lack of time, resources, office work, family, and social responsibilities.

1.9 Conceptual Framework

A conceptual framework refers to a useful analytical tool with several applications and contexts. It is used to distinguish between concepts and organize ideas (Henry, 2013). A framework of factors affecting female students' attitudes toward learning science subjects at the secondary school level is provided below. This model focuses on the factors that influence the attitudes of female secondary school students towards learning science subjects. Personal characteristics, school considerations, socioeconomic issues, and political-policy aspects are all considered. Each component of the model interacts with other factors that influence how female secondary school students perceive and are conscious of learning science subjects.

These variables, according to behaviorism theory, influence one's willingness to make decisions. The idea focuses on the factors that cause individuals to react negatively towards learning science subjects. Personal factors, including interests and beliefs, are the strongest influences on girl students' attitudes towards learning science topics in secondary school.

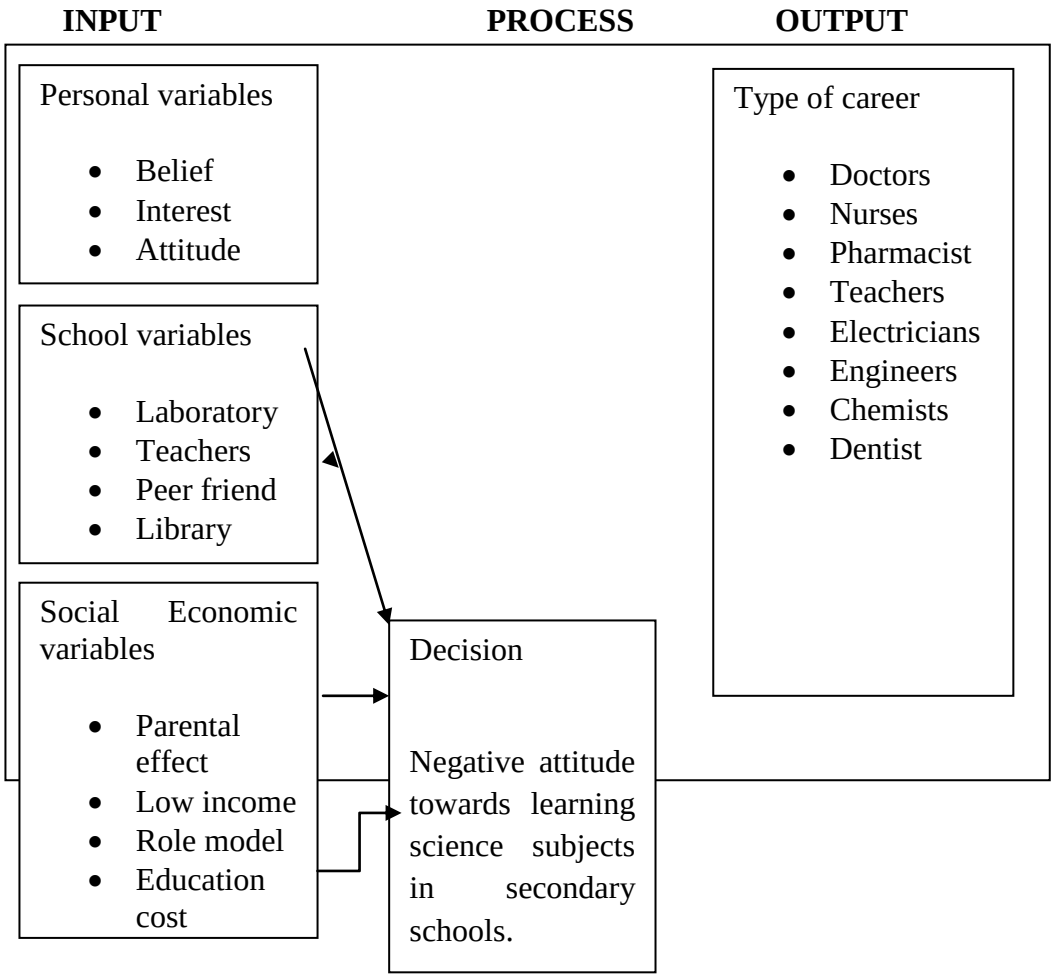


Figure 1.1: Conceptual Frame Work

From the figure above, Input stands for variables such as individual variables, school variables, and social economic variables. If these variables are improved, they are likely to improve girls attitude toward learning science subjects in secondary schools.

In order for the process of teaching/learning process to be favorable, there is a need to have well designed and motivated teaching and learning environment. Furthermore, the output is the end result from the Input and process. In this study the end result were different carrier jobs obtained from studying science.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of both theoretical and empirical studies on science as a subject as well as how it is learned and taught in secondary schools. The literature involves concepts from a variety of countries, with a focus on the Tanzanian setting

2.2 Conceptual Definitions

2.2.1 Learning

Learning refers to the process of acquiring new understanding, knowledge, behaviour, skills values, attitude, and preferences (Mwamwenda, 2014). In this study, learning is understood as the process of acquiring new knowledge and skills.

2.2.2 Science Subjects

Science is “the field of study concerned with discovering and describing the world around us by observing and experimenting. Science subjects include subjects such as biology, mathematics, physics, computer science, and agriculture (URT, 2010).

2.2.3 Secondary Education

Secondary education refers to the second stage of education. In Tanzania, secondary education is a four years education, which is preceded by seven (7) years of primary education and proceeded by two years of advanced secondary education (URT, 2010).

2.3 Theoretical Literature Review

There are several theories that describe how science is taught in schools. Some of them are shown below;

2.3.1 Constructivist Theory of Learning

According to this theory, a learner's ability to learn is largely determined by what they already know and understand, their experiences, or their "readiness," and that knowledge acquisition should be an individually constructed process of knowledge construction and interpretation (Ackermann, 2001). According to Jonassen, (1999). The purpose of the teacher is to promote and facilitate discussion, guiding students to reach their own conclusions on the subject being discussed. Students mostly work in groups, learning and knowledge are interactive and dynamic, and a strong emphasis is placed on social and communication skills, as well as collaboration and the exchange of ideas.

In CLEs (Classroom Learning Environments), learning is driven by the problems to be solved; students learn the problem to be solved based on prior experiences, related cases, and scaffolding; thus, science teachers must provide an authentic context for tasks, as well as information resources, cognitive tools, and collaborative tools, such as oral discussions and the KWLH chart (What we know, what we want to know, what we have learned, and How we know it), mind mapping, hands on activities and pre-testing. Girl students should be explored due to their desire to overcome challenges in science subjects, to gain social approval, and to overcome past records (Storm & Bernard, 1982).

2.3.2 Behaviorism Theory of Learning

The behavioral view of learning is based on the stimulus and response model, which suggests that learning occurs as a result of associations formed between a stimulus and the response to that stimulus, as well as the presence of some type of reinforcement (Mwamwenda, 2004). This depends on an individual's behavior of employing the trial-and-error method to solve challenges in their studies (Boakes, 2021).

In the classroom, the teacher must understand how to motivate and assist students, especially girls, who are viewed as passive participants. A teacher demonstrates to students how to react and respond to different stimuli by using positive reinforcement and repetition. Students, particularly females, can be motivated by both positive and negative reinforcement. A female student who receives praise for a high test score in science studies, for example, is much more likely to learn well and see a direct correlation to continued success than a female student who does not receive praise for a good test score in science studies. A student who does not receive praise is experiencing negative reinforcement since the brain tells them that even if they achieve a good mark, it is meaningless.

Science teachers should build positive relationships with students, particularly girls, and help them create a favorable attitude toward the school curriculum, increasing their chances of successfully completing science studies (Zanden & Pace, 1984).

2.3.3 Social Learning Theory

Observational learning is another term for social learning. The theory is based on

what the child learns in his environment through imitation and modeling as he/she interacts with and observes others. Female science teachers can use social learning theory to influence student behavior by being role models for students, particularly girls, by instilling positive attitudes toward science subjects or by informing or advising them about the various careers that can be obtained through learning science, such as engineering, becoming doctors, and becoming scientists (Davis, 1983). Most secondary schools do not have female science teachers, and as a result, students do not have important role models from whom to learn how to deal with the female-related issues that females experience in school (Bennars et al., 1994).

According to Evans (2006), the presence of female science teachers as role models increases girls' awareness and opinions of science-related subjects, raising their sense of competition and promoting positive attitudes in general. As a female science teacher interacts with students, they have the potential to develop healthy life habits that lead to active learning behaviors such as attentiveness in science study, polite ways of asking and answering questions, and positive ways of inquiry and response. Learning leads to better academic performance.

It is the teacher's responsibility to be kind with all of her female students and to assist them become the people that society expects them to be through the use of psychological principles.

2.4 Empirical Research in Developed Countries

Studies in mathematics and science education are still lacking in many parts of the world that look at why female students opt for or skip these subjects after they are

made optional. There is still much to be done to determine what influences students' subject selection when subjects become optional (Mujtaba et al., 2012).

According to the EWC (Engineering Workforce Commission) study from 2005, the overall number of female students receiving bachelor's degrees in science and engineering has decreased by 19.8% in the United States, the United Kingdom, and other nations during the last 20 years.

Furthermore, the 2018 research discovered that girls and boys do not differ in their mathematical and scientific aptitude, but they do differ in their motivation and confidence in STEM (science, technology, engineering, and mathematics) subjects. Between 2017 and 2018, only 30% of girl students were studying physical science, and it was found that the pass rate for girls in science and engineering was 19% (Engineering WorkForce Commission, 2018).

Challenges such as the persistent lack of specialist science teachers, the way science subjects are taught in secondary schools, and the ongoing fall in the proportion of the school groups that study science subjects are reported (Rogers, 2009).

Research shows that the enrollment of female students has been declining at varying rates in France, Germany, and other developed nations. For instance, the pass rate trend in some of the nations was as follows: Norway saw a 40% drop between 1994 and 2003; Denmark saw a 20% decline between 1994 and 2002; Germany saw a 20% decrease between 1994 and 2001; and the Netherlands saw a 6% decrease between 1994 and 2001 (OECD, 2007).

According to the Eurobarometer research study on European information conducted in 2005, the reason for girls' students not being attracted in taking science subjects consists of insufficient science specialists to encounter the national needs, and the link between attitudes toward science subjects and how science subjects are taught affects female learners. Many high-STEM-ability female students fail to fulfill their full STEM potential in high school or drop out of the STEM track in college due to a lack of sufficient motivation.

In a 2008 report, a public high school authority in the United States found that middle school students had very little interest in academics related to STEM careers in high school; however, girls had greater interest in arts, literature, business, and entertainment careers than boys did. As a result, many American high schools struggle to enroll enough female students in STEM-related courses, greatly increasing the likelihood that all high school courses to have low STEM enrollments (Rogers, 2009).

Additionally, there is a lack of support for mathematics and science teachers, including sufficient professional development as well as relevant and interesting curricula.

Due to a lack of perfect and collective principles for science and mathematics in the country that will assist all actors in the system in setting and achieving goals, too many American female students determine early in their education that STEM subjects are dull and too difficult, leaving them unprepared to meet the challenges that will face their generation, country, and the world. According to research, many

teachers in the United States are unprepared to teach mathematics and science (Education News, 2010). According to the research, more than 90% of parents had little or no influence on their daughters' science-based decisions, and less than 10% of parents had a significant impact on their daughters' science-related studies. The research additionally revealed that, in terms of influence on girl students, parents were ranked first, followed by teachers, in assisting girl students' choices for science and career development. However, the majority of parents felt that they wished they had more inspiration over their daughters' career choices (Taylor et al., 2004).

Robinson and Ochs (2008) discovered that peer pressure and friends were significant motivators for high school girls to pursue science.

2.5 Empirical Studies from Developing Countries

It has been reported that girl students were affected by their perception of science as difficult and thus concentrated on arts studies. The way the subjects are taught, their attitude toward the subjects, and societal and cultural factors are usually to blame for their giving up of science and mathematics (Wasanga, 1997).

Krebs (1972) claims that the issue of a lack of quality education in science subjects, a lack of learning incentive for science subjects, a lack of sufficient details about science subjects, and a lack of help to persons in making and employing science choices cause some female students to hate science subjects.

Munro and Elson (2000) performed research in certain developing nations and found that only 30% of students studied physics and 32% studied chemistry and

mathematics at their higher education institutions in 1994. In 2005, these percentages fell to 25% and 26%, respectively (Lyons, 2005).

In their study on the benefits and opportunities of science and mathematics-based employment for women, Kaundia and Inanga (2001) found that the selection of optional subjects is mostly affected by the interaction between the curriculum and the customer. All applicants who meet all of the conditions are awarded the Kenya secondary education certificate. Candidates are required to take at least seven topics from groups 2, 3, 4, and 5. In-group disciplines such as English, Kiswahili, and mathematics are also necessary.

According to Farrant (1997), in Botswana, most females were motivated to study geography just because of their relationship with their chosen careers. As a result, teachers must understand their female students closely and be familiar about jobs and the job market in order to guide them in the right direction.

Teachers' attitudes and practices, according to Salisbury and Ruddel (2000), influence girl students' topic choices in a variety of methods. Several teachers might have strong emotions about a subject's fitness for boys and girls, which they may prompt in a number of open and hidden ways. The involvements of boys and girls in many parts of the curriculum might quiet vary due to teachers' outlooks and behaviors. The sex disparity between instructors may have an impact on gender inequalities in subject preferences. According to the Equal Opportunity Commission (1987), a lack of non-stereotypical role models among teachers' topic specialties encourages sex stereotyping in curriculum decisions. Each child should be provided

with a strong foundation in life skills through education and supervision. Some teachers may have strong views about their students developing marketable skills that will help them find job (Peninah, 2012). According to research, proper services and apparatus for actual science education are needed in secondary schools to increase female participation and performance in mathematics, science, and information technology.

Eshiwani (2001) discovered that girls' schools are moderately fewer provided with the services required for teaching science subjects, which discourages girls' access to extensive choice of science subjects as they are focused in art subjects. The research directly states that the supply and enhancement of services for teaching science in schools is an essential aspect for promoting girls' involvement in science.

Krebs (1972) claims that the issue of the lack of high-quality instruction in science subjects, the shortage of learning incentive for the subjects, the absence of sufficient information about the subjects, and the lack of assistance for characters cause some girl students to avoid choosing science subjects.

Hizza (2012) discovered that none of the schools under investigation had libraries or laboratories. This was one of the issues confronting the majority of Tanzanian secondary schools (URT, 2010). Despite the lack of libraries and laboratories in government schools, 41% of female students’ desire to specialize in science, while 59% want to specialize in the arts. This indicates how a dearth of libraries and laboratories in schools delays female students' aspirations to pursue jobs in science.

Parent-teacher communication and social interaction can have an impact on a student's academic success. According to research, most parents do not monitor their children's academic progress, making it difficult for teachers to care for students because of a lack of parental support. Parental weakness to keep students engaged is one of the factors influencing the low academic performance of secondary school students in day school districts, particularly girls (Hizza, 2012).

2.6 Empirical Studies from Tanzania

The study discovered that, despite having a greater supply of sufficient scientific textbooks in Tanzanian secondary schools, there was an average of one textbook for every one student in forms I-IV and one textbook for every two students in forms V-VI. There was still a drop in interest in science subjects among female students (MOEST Performance Report 2018). According to this report, the overall amount of secondary schools rose by 0.9%, from 3604 in 2017 to 3636 in 2018, and student enrollment for both girls and boys increased rapidly. However, female students' ability towards science subjects was relatively low, as shown in Table 2.1.

From Table 2.1, the data show that the overall pass rate for sciences among girl students ranges from 37.8% in 2016 to 37.1% in 2017 (NECTA, 2016 and 2017). This shows that there was a decrease of 3.8% in the girls' physics pass rate from 35.6% in 2016 to 31.8% in 2017, and a decrease of 5.7% in chemistry from 51.3% in 2016 to 45.6% in 2017. Furthermore, mathematics continues to show the lowest pass rate in 2016/17 at 15.2%. This poor pass rate has been attributed to a shortage of

mathematics and science teachers in secondary schools, which has a significant impact on female students' decisions to pursue science subjects (URT 2018).

Table 2.1: Pass Rate for form IV (CSEE) by Science Subjects and Sex in the year 2016 & 2017 in Tanzania

Subject	Year	Candidates Examined			Candidates Passed			
		Male	Female	Total	Male	%	Female	%
Biology	2016	170025	178111	348136	103.949	61.4%	89,045	50.2%
	2017	156277	160211	316488	104,328	67.1%	88,938	55.8%
Basic Mathematics	2016	170549	178653	349202	37891	22.3%	25099	14.1%
	2017	156277	160700	317444	36288	23.3%	24333	15.2%
Physics	2016	70031	58757	128788	36613	52.5%	20840	35.6%
	2017	71398	59845	131243	36126	50.8%	18965	31.8%
Chemistry	2016	86302	77562	163864	57002	66.3%	39649	51.3%
	2017	85136	74990	160126	51082	60.3%	33994	45.6%

Source: (URT 2018)

Magembe (2008) saw a decline in the popularity of science among secondary school students, notably girls, especially those pursuing further secondary education in Tanzania. In particular, it was reported that there had been a decline in mathematics, biology, physics, and chemistry, with the decline ranging from 30% in 2005 to 25% in 2009 (NECTA, 2005; 2009).

Despite the fact that the overall PTR (Pupils Teachers Ratio) for science subjects in secondary schools was quite low, currently at a PTR of 17.3 and a PQTR of 18.7 overall and 22.1 and 22.3, respectively, in government schools, this was a major challenge in getting enough teachers in secondary schools in Tanzania for science, mathematics, and technical subjects (URT 2018).

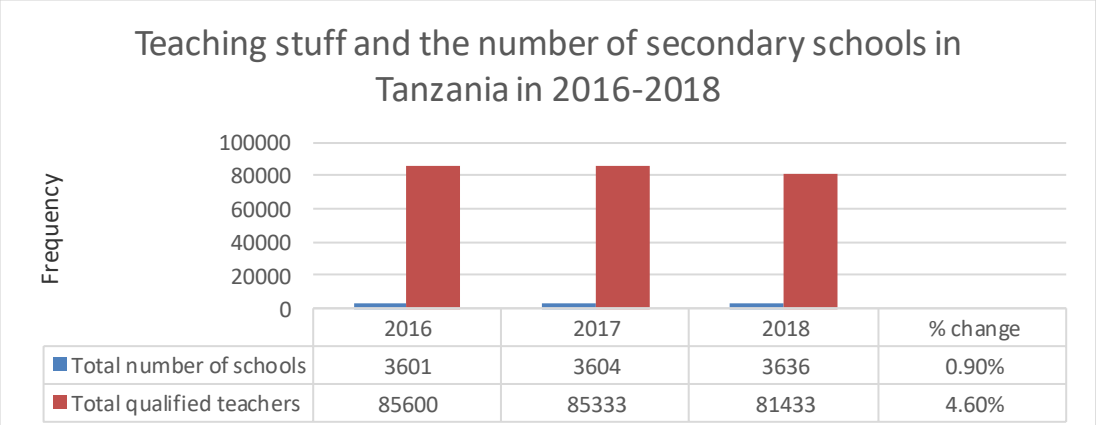


Figure 1.1: The Chart Depicts the Teaching Staff and the Number of Secondary Schools in Tanzania from 2016 to 2018

Source: Field Data (2022)

According to Figure 2.1, the number of qualified teachers fell by 4.6% from 85,600 in 2016 to 85,333 in 2017 to 81,433 in 2018. Furthermore, the number of secondary schools is increasing. This indicates that a shortage of skilled science teachers in Tanzanian secondary schools was a serious obstacle, causing students, particularly female students, to acquire unfavorable attitudes towards learning science, and so employment for science teachers is still required (MOEST Performance Report 2018).

Tanzania's government is striving to implement measures such as distributing Capitation Grants to secondary schools in order to improve education quality; identifying ten (10) Teachers Colleges specifically for the preparation of teachers for science and mathematics at the diploma level; increasing enrollment in Sokoine (SUA) and Mzumbe (MU) state universities for teacher training in mathematics and

science subjects; and prioritizing the hiring of graduate teachers. These initiatives contributed to a decrease in the number of mathematics and science teachers from 24,718 in 2015 to 15,851 in 2001; nonetheless, science instructors in secondary schools remained in inadequate supply (URT 2018).

Hizza (2012) observes that in four Moshi Region government secondary schools, arts-related subjects such as geography, history, and Kiswahili have more teachers than science topics like physics, mathematics, and chemistry. This suggests that the government's struggles to rise the number of trained scientists in the country will be difficult to achieve due to the country's insufficient number of science teachers.

Lyon (2005) believed that the failure in awareness in science subjects among Tanzanian students, particularly girls, was due to the way science was taught and learned.

According to studies, science is taught and studied more theoretically than observationally, experientially, and experimentally; this condition has an impact on students' interest in pursuing science subjects in higher education, particularly girls' motivation (Speering and Rennie 1996).

In Tanzania, the lack of science teachers, school laboratories, and school libraries were among the variables that added to meager student performance in science disciplines, particularly among girls (TLA, 2012).

Ndalichako's (2014) research sought to address two important issues. The first issue was; which subjects do secondary school students prefer the most?, and, the second

was; what factors contribute to the students' interest in or lack of interest in particular subjects? The results from observation, document analysis, and focused group discussions with Form 3 and Form 4 students reveal that most secondary school students, especially girls, favored arts subjects, particularly due to the difficulties they face when learning science. The motivation of some notable and successful members of their communities, the dedication and support of the subject teachers, the accessibility of science teachers and their methods of instruction, and the connection between the subject and the students' daily lives were among the factors that led girl students to prefer a particular subject (Ndalichako et al., 2014).

2.7 Girls Attitude towards Learning Science Subjects

Female students still show a lack of interest in learning science and technology, as well as a concern about being involved with social expenses, a shortage of role models, a lack of personal confidence, and the effect of traditional gender roles (MRC, 2001; 2004). The lack of role models, the lack of self-confidence, and the influence of traditional concepts in science subjects are some of the reasons that lead to females' negative attitudes about science (Leary, 2006).

Some students have a favorable attitude toward learning science subjects, whereas others have a negative attitude, particularly toward mathematics. Girls' attitudes toward science are said to be improved by keeping boys and girls apart in mathematics classes.

According to Petitt (1995), girls believed they were capable of becoming doctors, nurses, pharmacists, psychologists, electricians, or veterinarians, but they did not

desire to work in science. A high level of political interest in science issues leads to a broader viewpoint and offers legislative actions and possible school-level changes.

2.8 Science studies at Secondary Level in Tanzania

In Tanzania, admission to secondary school is determined by performance on the Primary School Leaving Examination (PSLE). At the lower secondary level, science topics such as mathematics and biology are required. If the school is science-based, students are also expected to take physics and chemistry. Before entering Form 3, students were selected by their teachers based on their performance in arts and sciences subjects in Form Two National Assessments. Basic applied mathematics is required at the upper secondary level for scientific and business students (UNESCO 2010).

Since Tanzania achieved its independence, science has been taught in every school, and with the implementation of the Education Sector Development Program 2000 (ESDP), it has been strengthened. The World Bank and other donors supported the Secondary Education Development Program (SEDEP I and II), which had an important effect on Tanzania's science education. Together with the Tanzania Institute of Education (TIE), curriculum materials specifically for the region were developed, and primary and secondary teachers obtained extensive pedagogical training to prepare them to teach the new curriculum (URT, 2010).

2.9 Science Subjects and Gender

Governments, international organizations, and non-governmental organizations (NGOs) are all working to improve female education. However, there is a gender gap

in education. Female students continue to have limited access to education, low involvement rates, and poor performance in science and mathematics subjects.

Mwamwenda (2004) argues that classroom issues were not the main cause of gender disparities in education, and home-based factors such as family size, household responsibilities, parents' education, and cultural and traditional attitudes all contributed to low female enrollment in school. When girls reach a certain age, they are removed from school to prepare them for marriage or to supplement the family income by selling, farming, or performing other money-earning activities.

When family income dictated that all children could not be educated, most females were pulled out of school while boys were left in school. When there are responsibilities to be done at home, such as caring for a sick family member, girls tend to miss school to do so. When girls reached a certain age, they were taken out of school to prepare them for marriage or to help supplement the family income by selling, farming, or performing other money-earning activities (Mwamwenda, 2004).

According to studies, high-ability girls' and boys' attitudes to failure in science disciplines differ significantly. Failure has a greater impact on girls than it does on boys, which has a detrimental impact on girls' future performance. As a result, boys outperform girls in STEM topics. Furthermore, many parents, teachers, and society in general continue to have lower expectations for females' performance in science and mathematics than for boys.

2.10 Factors Hindering Girl Students to Take Science Subjects

According to the study by Diamond (2008), the most important factor influencing girls' attitudes about learning science is the quality of the educational experience the teacher provides. The lack of trained scientific teachers who can provide a pleasant learning environment causes them to lose confidence and deliver a less exciting experience.

2.11 Strategies to Improve Performance in Science Subjects for Girl Students

Various governments and educational institutions have offered and implemented a number of ideas and strategies to increase girls' performance in science disciplines.

In 1990, the World Declaration on Education for All (WDEFA) prioritized the enhancement and accessibility of a quality education for female students, as well as the removal of all barriers to their participation in schooling. Tanzania's government increased the number of secondary schools, with many girls enrolled (Laura, 2009).

Furthermore, the Tanzanian government should take collective measures to generate enough competent science teachers in science subjects in order to equip and foster female students' interest in studying science.

Other initiatives include the Pre-Entry Scientific Program, which is run by various universities, and the introduction of the Science Education in Secondary Schools (SESS) project, which aims to improve scientific learning with a specific emphasis on promoting females' engagement in science (MCD, 2011).

Historically, efforts have been made through providing capacity building at all levels of education, including the provision of books in secondary schools, the construction of schools in oversubscribed schools, the construction of classes in secondary schools, the employment and deployment of teachers, engaging communities in student learning, prioritizing the employment of graduate teachers in Bachelor of Science with Education, increasing enrollment at the Public University of Sokoine (SUA) and Mzumbe (MU) for teacher training in mathematics and science subjects, as well as the disbursement of capacity grants to secondary schools for improving quality education (URT 2018).

2.12 Research Gap

The reviewed literature has covered a variety of topics relating to girls' attitudes towards academic performance in science fields. According to the examined literature, females' academic performance in science is still a significant problem in Tanzania and across the globe. However, the reviewed literature lacks explanation of girls' students' preference between science and other subjects, the attitude of girl students towards studying science disciplines, the obstacles facing females in learning science subjects, and the mechanisms and strategies for improving performance in science subjects among girl students specifically in Sumbawanga Municipal. Therefore, the present study sought to assess girls' attitudes toward learning science subjects and how to contribute towards shaping girls' achievements in science studies.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes and examines the research design and data collection methods utilized to answer the research questions of this study. The chapter specifically offers a research approach, research design, study area, target population, sampling methods and sample size, data collection methods, the validity and reliability of the instruments, data gathering technique, data analysis, and ethical considerations.

3.2 Research Approach

This study used a mixed methods approach in which both qualitative and quantitative approaches were utilized. In data collection, both qualitative and quantitative methods were applied. The researcher acquired quality information from competent respondents who possessed the necessary knowledge on subject selection among students and teachers to satisfy certain objectives by collecting data through the participants' own words. The method allowed for direct interaction between the researcher and the participants; data were collected using high-quality methods in natural settings (Weiten, 1989). Quantitative approach was applied to investigate the information that required numerical data from the respondents and documentary reviews.

3.3 Research Design

Research design refers to the framework for data collection in research that provides a logical and systematic strategy for leading an investigation (Khan, 2001). To gain a

greater understanding of the challenges at hand, the researcher used a survey study design to collect data from respondents. The design helped the researcher to meet the respondents face to face. It also assisted the researcher to acquire the data by using mobile phones easily. The research design assisted the researcher to get first hand primary data that was collected, maintained and analysed.

3.4 Study Area

The study was conducted at four secondary schools in Sumbawanga Municipality, namely Mazwi, Kizwite, Mafulala, and Kilimani. The researcher chose this area because it was related to the research subject. The area was chosen among other parts of the country because it seemed to lack the relevant studies on girls' attitudes towards learning science subjects while the problem of girls' poor participation in science subjects persists in the area. Sumbawanga Municipal is rapidly expanding, occupying a larger number of population centers and educational institutions such as secondary and primary schools. Thus, it was acceptable to carry out this study in this area because there were students from different family groups, resulting in a representative sample.

3.5 Population, Sample Size, and Sampling Procedures

3.5.1 Population

The research was carried out in Sumbawanga Municipal secondary schools by gathering suggestions from teachers, students, parents, district education officers, and ward education officers in order to obtain the necessary information. The emphasis was on female students' attitudes toward acquiring science-related subjects.

3.5.2 Sample Size

A sample is a true representative of the entire population to be studied (King'oriah, 2004; Leary, 2001). Kothari (2004) advocates that a good sample should be truly representative of the population, result in a small sampling error, be viable, economical, and systematic. The researcher intended to use a sample size that involved a total of 200 respondents, including 100 students, 40 parents, 52 teachers, 4 head of schools, 2 district secondary education officers, and 2 ward education coordinators, but unfortunately, 14 respondents did not attend; therefore, the researcher remained with a sample size of 186 respondents. This sample was believed to provide a good representation of the population, as it was not possible to access the whole target population. The table below represents the sample size of the study area.

Table 3.1: Sample Size of the Study Area

Sample	Population	Sample Size	Method of Data Collection
Girls' students from 4 schools (Mazwi, Mafulala, Kilimani, and Kizwite).	5453	95	Questionnaire and focus group discussion.
Teachers from four schools (Mazwi, Mafulala, Kilimani, and Kizwite)	167	45	Questionnaire and focus group discussion
Parents from four schools (Mazwi, Mafulala, Kilimani, and Kizwite)	92	40	Questionnaire and focus group discussion
District Secondary Education Officers	2	1	Interview and documentary review
Ward Education Officers	2	1	Interview and documentary review
Head of schools	4	4	Interview and documentary review
Total	**2214**	**186**	

Source: Field Data (2022)

Table 1.2: Sample Size of Teachers in each Selected School (Proportionate Sampling Method)

S/N	Name of school	Number of teachers	Selected respondents
1.	Mazwi Secondary School	44	10
2.	Mafulala Secondary School	35	12
3.	Kilimani Secondary School	35	12
4	Kizwite Secondary School	53	11
Total		**167**	**45**

Source: Field Data: 2022

3.5.3 Sampling Procedures

Orodho (2004) defines sampling as "the process of selecting a subset of cases in order to draw conclusions about the entire population." Both purposive and simple random sampling strategies were used in this study.

3.5.3.1 Procedures for Purposive Sampling

The strategy was utilized to obtain respondents specifically from school heads, ward education officers, and district secondary education officers. These were chosen because they had potential knowledge and experience of academic challenges and thus supplied relevant information on girls' attitudes regarding learning science subjects. The method was frequently utilized in qualitative research.

3.5.3.2 Procedures for Simple Random Sampling

The random selection of a representative population in a study is referred to as simple random sampling. It is often used in quantitative research when each participant has an equal chance of being included in the sample. The sampling was practical and relevant to the study, and it was also most likely to produce a sample that accurately reflected the population.

The researcher utilized this technique to identify teachers, students, and parents for the study. This method was adopted since it allowed each respondent to participate in the study. The students in their schools were picked randomly from each class (stream) to represent entire populations of their fellow students.

3.6 Data Collection Methods and Instruments

The study included both qualitative and quantitative data, and the research used more than two methods, theoretical views, and sources of information to evaluate difficulties involving girls' attitudes about science subjects, with the goal of increasing study validity. Data was gathered using both primary and secondary sources. The information was gathered using a variety of research tools, including instruments, interviews, a documentary review, and a focus group discussion.

3.6.2 Instruments

Both open-ended and closed-ended questionnaires were used as instruments of data collection in the field. An open-ended questionnaire provided a chance for respondents to respond to the questions according to their own understanding. A closed-ended questionnaire involved respondents responding to multiple-choice questions in the questionnaire. The questionnaire was employed because it offered data that was simply statistically analyzed.

3.6.3 Interview

The interview involved meeting the respondent face-to-face and asking them to respond orally. This instrument enabled the researcher to obtain accurate and timely

data from the heads of schools, district secondary education officers, and ward education coordinators. To acquire a complete understanding of the issue, the researcher used open- and closed-ended questions in direct interviews with school heads, ward education coordinators, and district secondary education officers. The researcher obtained data through personal interviews in a systematic manner that included the use of pre-determined questions that were asked in the form.

3.6.4 Documentary Review

Documentary sources are previously gathered datasets (Kombo and Tromp, 2006). Secondary data for this study was obtained from books, journals, and the internet. They included records of secondary school examination performance in science subjects, the number of science teachers in secondary schools, the number of students registered in schools, as well as published and unpublished books, school records, and research reports on girls' attitudes toward studying science subjects. Some of this information would have been quite impossible to obtain using other research methods; however, these documents were relatively simple to access and relevant for this research. The majority of them were available at the offices of heads of schools and district education offices.

3.6.5 Focus Group Discussion

This is a collection of interviews in which participants are asked questions regarding a topic chosen by the researcher (Morgan, 1996). The researcher used this strategy to identify interaction in a group discussion as a source of data collection. Sessions extend 30 to 40 minutes to allow for a thorough examination of the topic, and group

sizes range from eight to twelve (8 to 12). This strategy assists the researcher in gathering the evolving views of the participants and therefore obtaining a significant amount of data.

3.7 Validity and Reliability of the Instrument

3.7.1 Validity of the Instruments

Orodho (2004) asserts that determining a questionnaire's validity entails determining if the content measures the intended outcomes and functions as intended. Since 100% validity of an instrument is uncommon, if not practically unattainable, validity is typically expressed as a percentage. There were several statistical tests and procedures to assess the validity of quantitative instruments, which often entail pilot testing, and validation as a process involves gathering and evaluating data to assess the correctness of an instrument. The researcher submitted the questionnaires through a preliminary test. During the pilot, some students were chosen at random, and questionnaires were distributed to them in order for the researcher to gather the necessary data.

3.7.2 Reliability of the Instruments

The consistency with which an instrument produces the same results each time it is used is referred to as reliability. To assess the reliability of the research tools, a pilot study was conducted with a few students, parents, heads of school, ward education officers, and teachers from the selected schools. In reliability, the term "coefficient" refers to the method of testing the instrument's accuracy on the same respondents in

order to compare the findings of the measures to establish consistency (Levitas, 2021).

By giving respondents a questionnaire and asking them to rate their agreement with each item on the provided Rickets scale, the researcher was able to collect both optimistic and pessimistic assessments of girls' perceptions towards pursuing science subjects. In order to get information on the opinions of female students about studying science subjects, the researcher also employed inter-rater reliability to look at the degree of agreement among various groups of survey respondents. The answers to the research questions assisted the researcher recognize hard and unclear items so that they could be properly improved.

3.8 Data Management and Analysis Procedures

According to Kothari (2006), data management entails the editing, coding, classification, and tabulation of obtained raw data in order to prepare it for analysis. The researcher obtained the data in the field, both qualitative and quantitative statistical methods were used to examine them. Different tables, charts, and percentages were used to present and assess quantitative data, while descriptive analysis was used to explain, analyze, and present qualitative data.

3.8.1 Analyzing Qualitative Data

The qualitative data were collected from key informants who were essential in improving and assessing female students' attitudes and obstacles when learning science subjects in order to suggest solutions to improve female science performance. Content analysis was used to assess qualitative data. The strategy

performed effectively for data collection and analysis. The purpose of content analysis was to describe the documentation by determining who says what, to whom, and to what effect (Bloor & Wood, 2006).

3.8.2 Analyzing Quantitative Data

Statistical Package for Social Sciences (SPSS) version 22 was used to clean, code, verify, and analyze raw data. The SPSS and Microsoft Excel 2003 applications were used to handle and analyze data on the attitudes of female secondary school students about learning science subjects. Descriptive statistical analysis was utilized for producing frequencies and percentages, as well as various types of charts. Tables, pie charts, and bar graphs were used to show the results.

3.9 Ethical Consideration

The Open University of Tanzania (OUT) and the research supervisor approved the research's ethical conduct. The study claims that the researchers took specific ethical considerations into consideration, such as announcing the study's purpose to participants, ensuring their information's confidentiality before data collection, and treating them with respect and courtesy. An informed consent technique was used in order to prevent disagreement and conflict. By using private questionnaires and performing private interviews to increase participants' knowledge and improve their freedom of expression. The researchers then requested the participants' permission to proceed with the study or not.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

The research findings are presented, covered, and analyzed in this chapter. The study's research objectives, which are to examine girls' preferences for studying science and other subjects, assessment of girl students' attitudes toward learning science subjects, examination of obstacles that girls face in learning science subjects, and suggesting strategies for improving performance in learning science subjects, are outlined in Chapter 1. The chapter begins with the explanation of the demographic characteristics of the participants.

4.2 Demographic Characteristics of the Participants

The demographic characteristics of the respondents, such as age, sex, gender, educational level, occupations, and economic status of the guardian, are described in the form of tables, graphs, and pie charts. This is shown in Table 4.1 below:

4.2.1 Respondents by Age, Sex and Gender

Table 2.1: Respondents by Sex and Gender

Sex/Gender	**Students**	**Teachers**	**Parents**	**School Heads**	**WEOs**	**Total**	**%**
Male	32	29	20	3	2	**86**	84
Female	63	16	20	1	0	**100**	
Total	**95**	**45**	**40**	**4**	**2**	**186**	

Source: Field Data (2022)

The age, sex, and gender of study participants were reported in order to gain specific information on the attitudes of females toward learning science subjects in secondary

schools in the study area. There were 95 students in all, 32 boys and 63 girls, with 76 students, or 60%, aged between 16 and 20 years old, and the majority of them were in Form III and IV classes, where selections for optional subjects begins. The results were acquired without bias from both gender groups. The researcher enrolled a significant number of female students in order to obtain detailed data regarding their attitudes about learning science subjects in secondary schools.

To examine the research issue of girls' attitudes about learning science subjects, the researcher obtained a team of teachers, school heads, WEOs, and parents, a total of 54 males and 37 females aged 31 to 40 years old, representing 78% of the entire population.

This age group has more experience directing, influencing, facilitating, advising, and leading students' attitudes toward science learning and achievement, as well as monitoring educational policies.

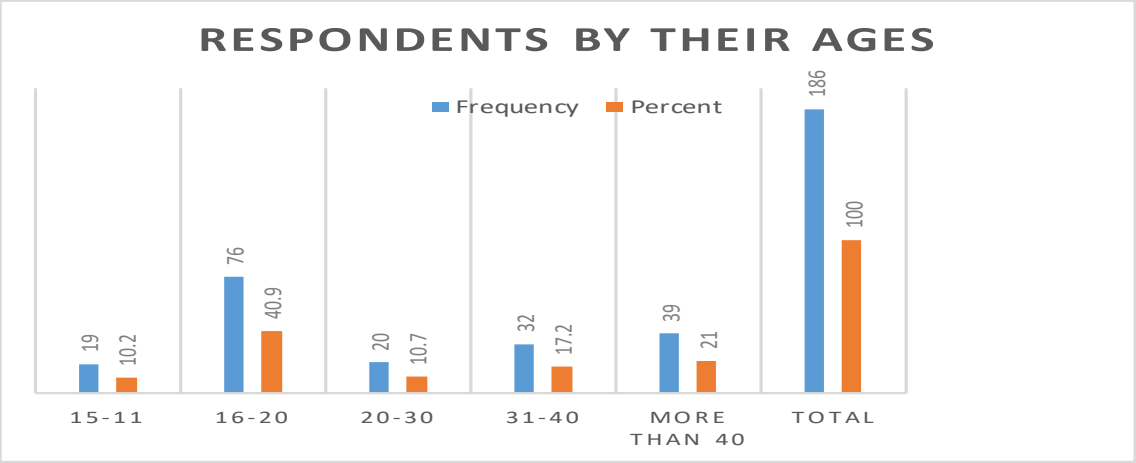


Figure 4.1: Respondents by their Ages

Source: Field Data (2022)

4.2.2 Participants Organized by Occupation

The researcher sought information about the participants' occupations from the group of parents in order to ensure their professionalism and collect accurate information about the subject selection. According to the data, the majority of the parents involved in the study population, worked in various occupations. The majority were teachers and business men/women with enough data to provide, as shown in the pie chart below.

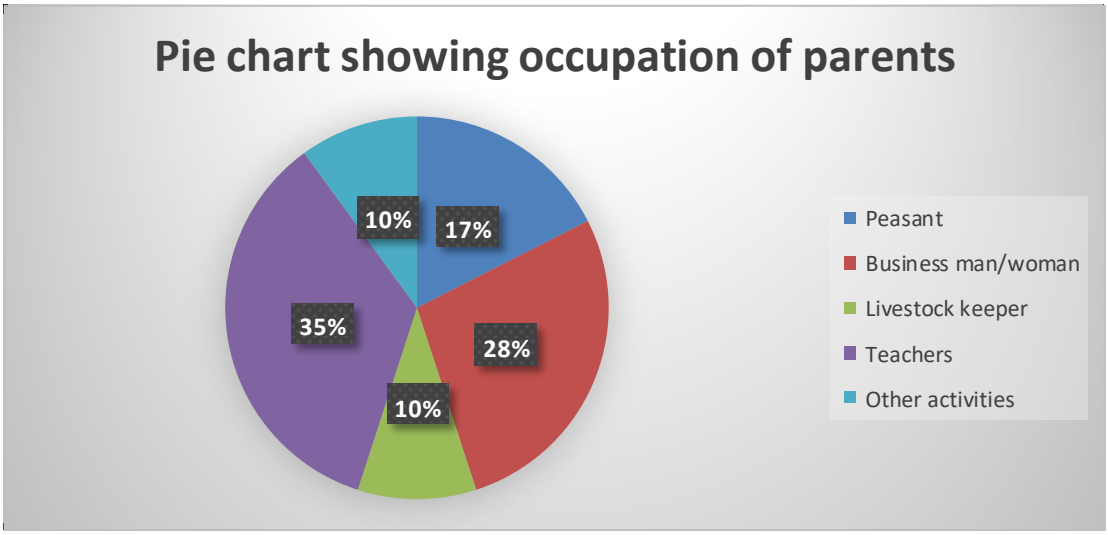


Figure 4.2: Pie Chart Showing Occupation of Parents

Source: Field Data (2022)

4.2.3 Participants by Educational Level

The participants' educational level was provided in order to recognize their ability to answer research questions and allow the researcher to transform data obtained in the field. According to the data, 13.3% of parents and guardians completed primary education, 42.9% completed Form 4, and 42.9% completed diploma or higher levels. According to the pie chart below, the researcher believes that the majority of this

group was educated enough to respond to questions about subject selection at the secondary level of education.

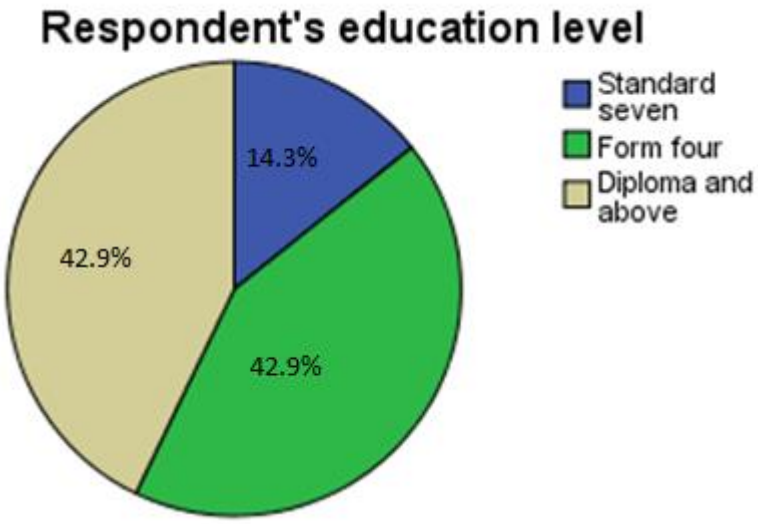


Figure 4.3: Pie Chart Illustrating the Education Level of Parents and Guardians of Students

Source: Field Data (2022)

4.2.4 Participants by Subjects

The researcher gathered information about the subjects of their interests. 50 students out of 95 equals 52.6% of students who opted to study arts subjects, while 45 (46.3%) of students opted to study science subjects. Out of 45 participants who opted science subjects, only 36.3% were female students while 64.7% were male students.

These data indicate that, although science subjects were taught to a large extent in secondary schools, a large number of students especially girls, wanted to specialize in art subjects. This information provides the whole picture of the attitudes of

students, particularly girls, towards learning science subjects because a large number of the target population of students opted to study art subjects.

During the study, it was observed that 51.1% of respondents were teachers of science subjects and 48.1% were teachers of art subjects. This indicated that the researcher got detailed information from all art and science teachers without bias on the subject selection concerning the attitude of girls towards learning science subjects in secondary school.

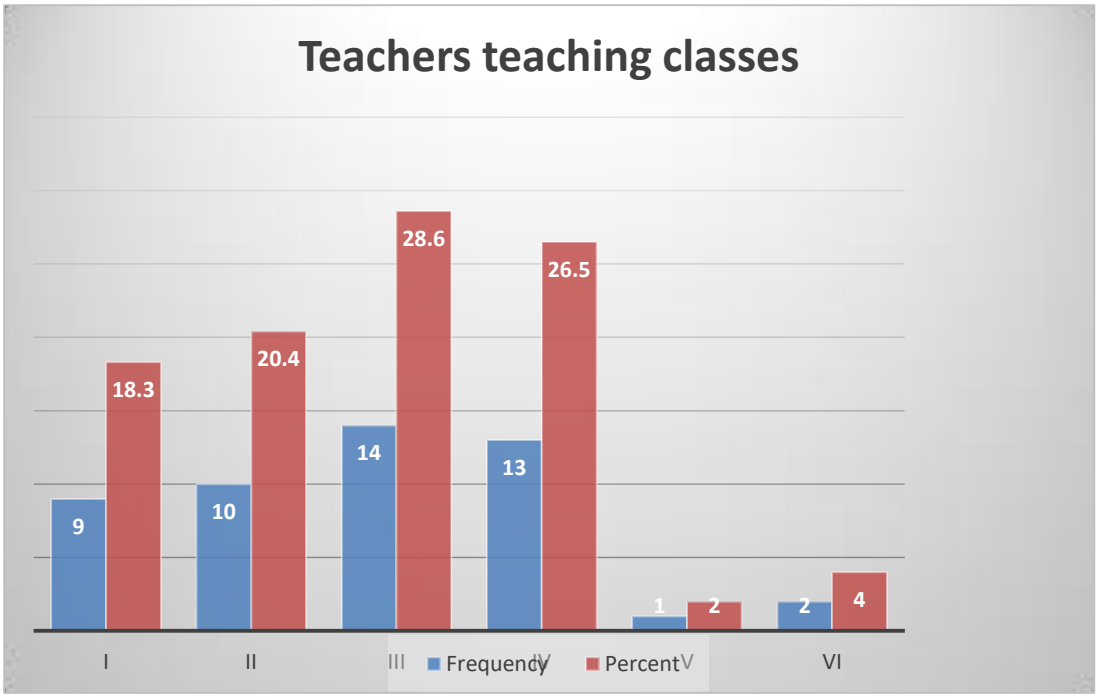


Figure 4.4: A Bar Chart Showing the Number of Teachers by Their Teaching Classes

Source: Field Data (2022)

According to the bar chart above, the majority of teachers (55.1%) taught in Forms III and IV. Only 6% of teachers taught Forms V and VI, whereas 38.7% taught Form

I and form II. According to the data, the majority of respondents were discovered teaching in Form III and Form IV; hence, the researcher received appropriate information on girls' attitudes towards learning science subjects because choice begins at this level, particularly in Form III. Teachers had enough experience about students particularly girls attitudes towards learning science subjects and their choices to continue with science subjects and who should drop science subjects at this level based on the pass rate in the Form Two National Examination.

4.2.5 Girls Preference for Studying Science and Other Subjects

This section includes findings from a research study of the preferences of female students for studying science and other subjects. The researcher collected information from teachers, students, and parents using a questionnaire and an interview guide from heads of school, ward educational officers, and district secondary educational officers.

The researcher intended to examine girls' preferences for studying science and other subjects. Different questions were asked to investigate whether female students prefer to take other subjects over science subjects. The data revealed that out of 95 respondents who filled in questionnaires, thirty eight (40%) said "no" meaning that girls prefer to take science subjects over other subjects. Fifty-seven (60%) said "yes" meaning that female students prefer to take other subjects over science subjects. The findings imply that most girls prefer other subjects to science, as illustrated in figure below:

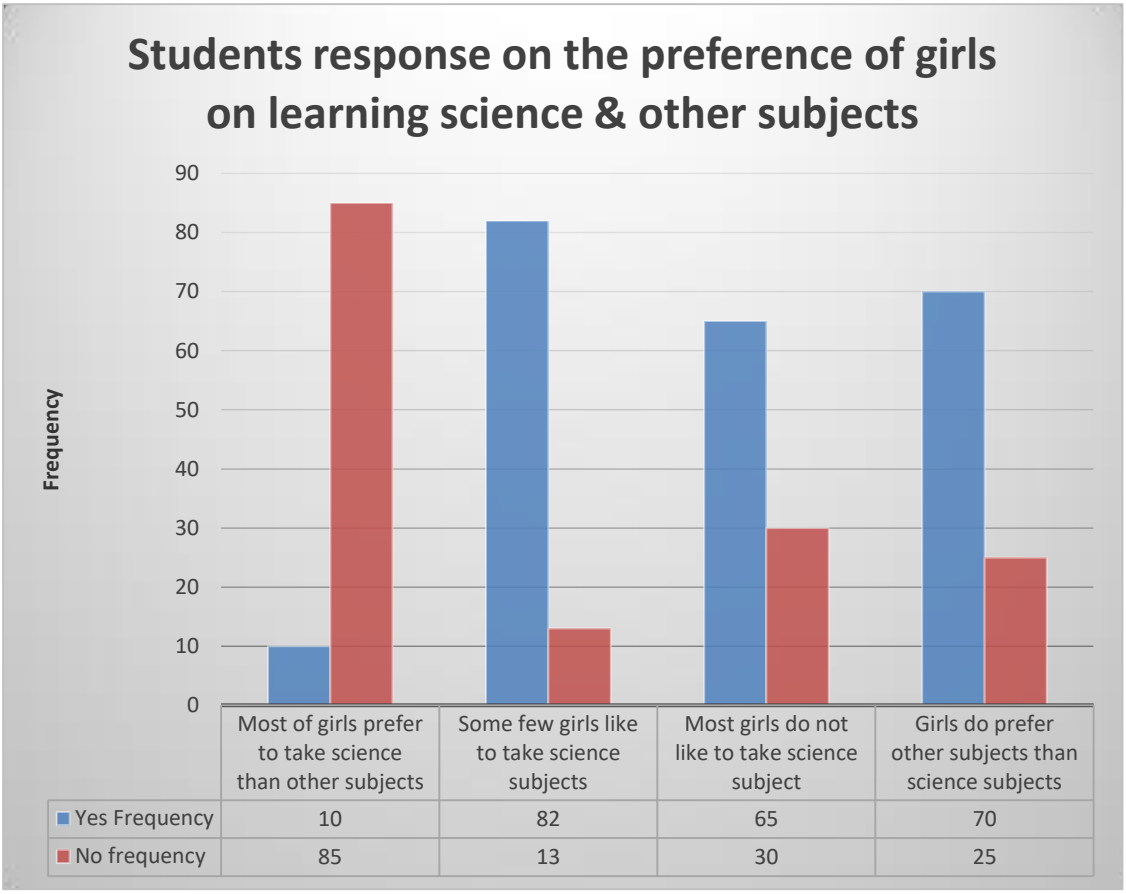


Figure 4.5: Students' Response to the Preference of Girls Towards Learning Science Subjects and Other Subjects

Source: Field Data, 2022

However, the researcher asked 45 respondents from the group of teachers who filled in questionnaires to investigate whether female students prefer science subjects to other subjects. In general, 74.8% of teachers said "no," indicating that most girls prefer other subjects over science subjects, while only 25% said "yes," indicating that few girls prefer science over other subjects. The table below indicates the findings from the teachers.

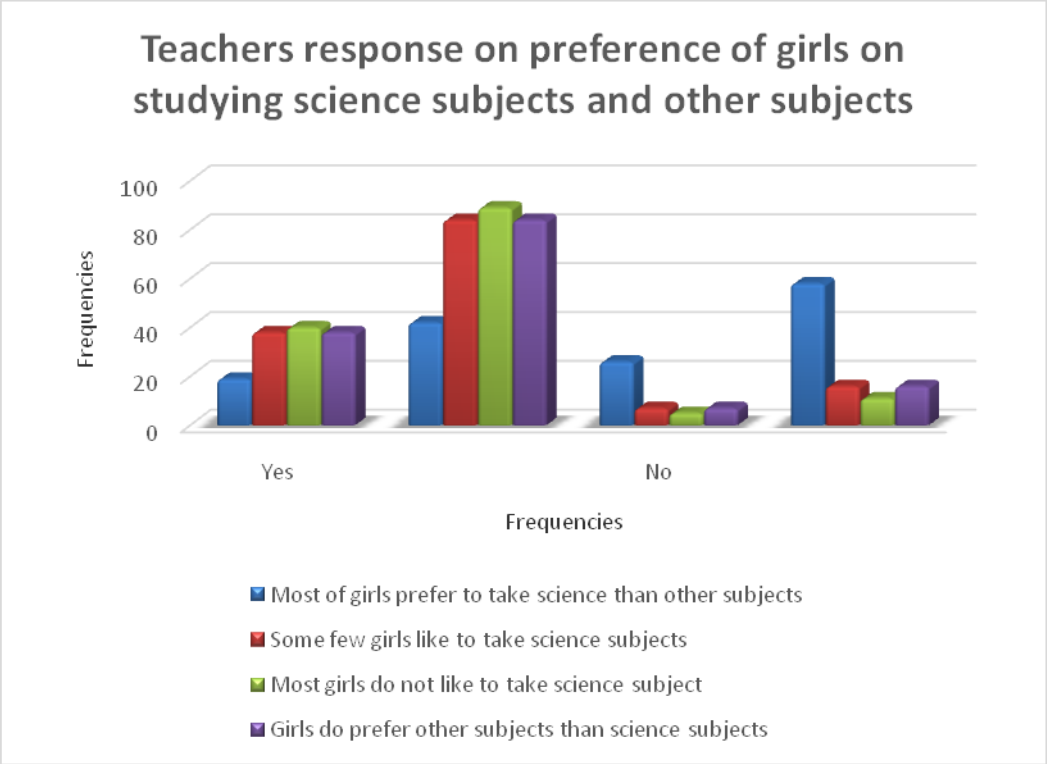


Figure 4.6: Teachers Responses to the Preference of Girls Toward Learning Science over Other Subjects

Source: Field Data, 2022

The same questions were asked to the parents who filled in the questionnaires. The findings reveal that 55% of parents agreed that most girls prefer science subjects to other subjects; 27% agreed that some girls like science subjects; 12.5% agreed that most girls do not like science subjects; and 5% agreed that girls prefer other subjects than science subjects. Based on these data, the researcher realized that parents had little or no information about whether their daughters liked science subjects or not. They responded depending on their personal interests and desires. The table below indicates the data from the parents.

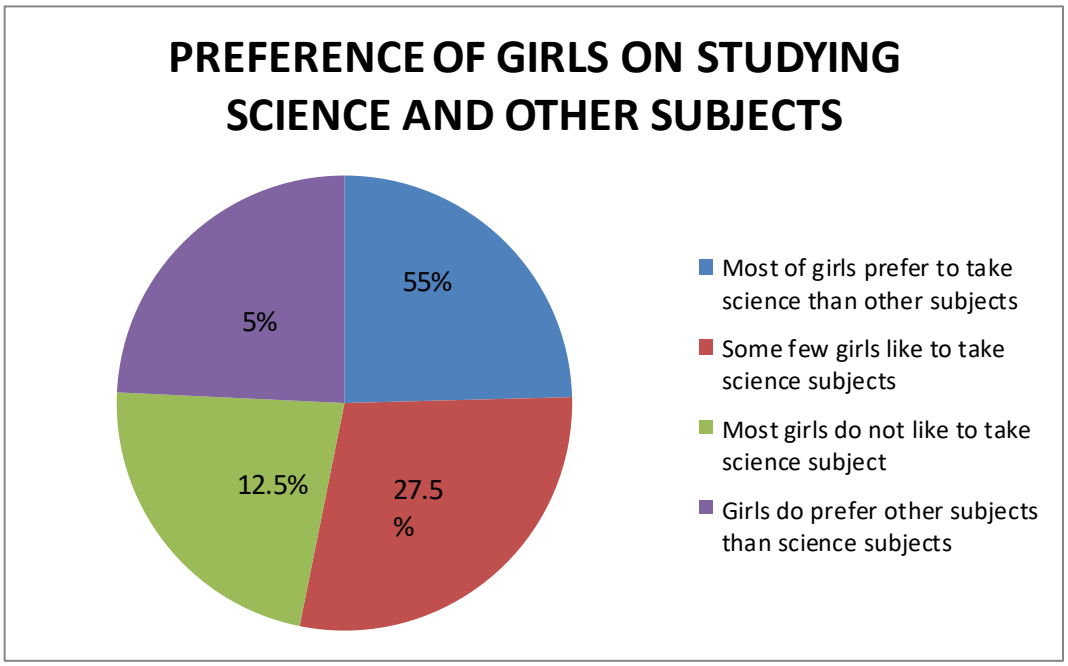


Figure 4.7: Pie Chart Showing Responses from Parents

Source: Field Data, 2022

An interview was conducted with the heads of schools and ward coordinators to identify who were more interested in science subjects among male and female students. Male students choose more science subjects than female students, according to all six respondents. As a result of their comments, female students choose courses other than science, as already observed. One of the respondent was quoted saying,

> *"Most of the girls prefer art subjects due to the gender and biological factors; some of them are given many responsibilities and chores to perform in their homes, the long distance they walk to and from schools, peer pressure, lack of role models and other related factors restrict them from choosing science subjects. The reason behind is that science subjects require the students to invest much time while most of girls do not have such time* "Respondent 2 male, 38 years".

This is a real situation in most families where girl students fail to take science subjects not just because the lack capabilities and interests but because there are other external socio-cultural factors which limit them in one way or another.

Moreover, the investigation of girls' preference on science subjects over other subjects indicates that most of girls prefer other subjects to science subjects. Only few of them showed an interest to prefer science subjects to other subjects. The reasons attached to this preference of other subjects over science subjects included; wrong messages they receive from their community that science is hard and male-oriented, peer pressure, household chores, lack of self-confidence and lack of inspiration from significant figures (role models)

The literature also confirms the above findings about female students' preference for other subjects over science subjects. The NECTA results for CSEE 2020 and 2021 indicate that the pass rates of female students in science subjects are low when compared to the pass rates of boys in such subjects. These pass rates were used to determine the girls' preference on science subjects. The poorer the girls performed in these science subjects indicated that girls had not invested much time in science subjects but they concentrated on other subjects as illustrated in Table 4.2.

Table 4.2: Form Four (CSEE) Science subjects Pass Rate in Relation to Sex in the years 2020 and 2021 in Four Selected Schools in Sumbawanga Municipal

Subject	Year	Candidates Examined			Candidates Passed			
		Male	Female	Total	Male	%	Female	%
Biology	2020	473	566	1044	388	82%	42	7.3%
	2021	548	571	1114	432	78.8%	244	42.7%
Basic Mathematics	2020	473	571	1044	118	24.9%	68	11.9%
	2021	552	571	1125	125	22.6%	68	11.9%
Physics	2020	110	49	159	77	16%	42	7.3%
	2021	108	60	168	99	18%	52	9.4%
Chemistry	2020	120	68	188	119	25%	69	12%
	2021	119	87	206	119	21.7%	87	15.5%

Source: NECTA 2020, 2022

From the above table, the overall pass rates of girl students in mathematics, physics, and chemistry range from 10.4% in the 2020 year to 12.2% in the 2021 year in Sumbawanga Municipal.

The study found that art subjects such as geography, history, and Kiswahili have higher enrollments of female students in each secondary school compared to science subjects. Most girls prefer art subjects to sciences. Currently, it is observed that the number of classes in the four secondary schools under the study increased due to the COVID-19 construction project, which was completed, but there was an insufficiency of science teachers, which led most students, especially girls, to enroll in art subjects rather than natural sciences. This implies that the government's effort to increase the number of qualified scientists in the country will not be easily attained because of the inadequate number of science subject teachers in secondary schools in Tanzania, as shown in the MOEST Performance Report for 2018–2019.

The evidence from the literature reviews also suggests that the overall condition of Tanzanian girl students' preferences for science subjects was a warning sign that it was less likely. To encourage more girls to pursue science subjects, the government should take corrective measures to produce or import sufficient experts in science subjects (NRC, 1996).

Krebs (1972) points out the fact that, before choosing subjects, there was a need for a complete and consistent system of preference that allowed a choice among the alternatives because the learning environment was critical to how girl students could view a subject. Some studies conducted by other researchers confirm that when choices of opting subjects were available, most girls tended to prefer language and social science subjects to Science subjects (Pratt et al., 1984). This happens simply because girls think that science subjects are hard and male-oriented.

Sulisbury and Ruddel (2000), for example, propose that some students choose a subject only because they like the teacher. Some teachers have strong opinions about whether their subjects are appropriate for both males and females, and they express their opinions both overtly and covertly. Based on these results, it was concluded that most girls do not favor science over other subjects, a conclusion supported by other research and empirical evidence, and that female students' behavior to favor other subjects over science may be influenced by their teachers' attitudes toward subject selection in a variety of ways.

A review of other literatures also confirms that there is little parental influence on students' preferences for science subjects over other subjects. According to Taylor et

al. (2004), most parents have minimal influence on their daughters' preferences for learning science subjects. This is inconsistent with the findings that parental support and encouragement were less important in motivating female students to choose science.

The researcher observed that most of the female students would like to take science subjects but they face many challenges including the household chores, distance to and from schools, teaching methodologies, lack of role models and other related factors. The researcher finally concluded that the notion that girls do not prefer science subjects has been out of date, currently this notion is changing gradually because most of the girls nowadays like to study science subjects due to continuous government measures taken and motivations such as; promoting more girls who pass science subjects from Form Two National Assessment and promotion of employments among the science teachers and officials in health department.

4.2.6 Attitudes of Girl Students Toward Learning Science Subjects in Secondary Schools in Tanzania

The researcher sought information to gather findings for objective II, which attempts to assess female students' attitudes towards learning science subjects. 95 students from the field answered by filling in the questionnaires on the "Attitude of Girl Students towards Learning Science Subjects. The data from the field revealed that 61.9% of students said "yes," meaning that most of the girls do not like to take science and they think that science subjects are harder and more male-oriented

subjects, while 38.1% of students said "no." Figure 4.8 below indicates the attitudes of girls toward learning science subjects.

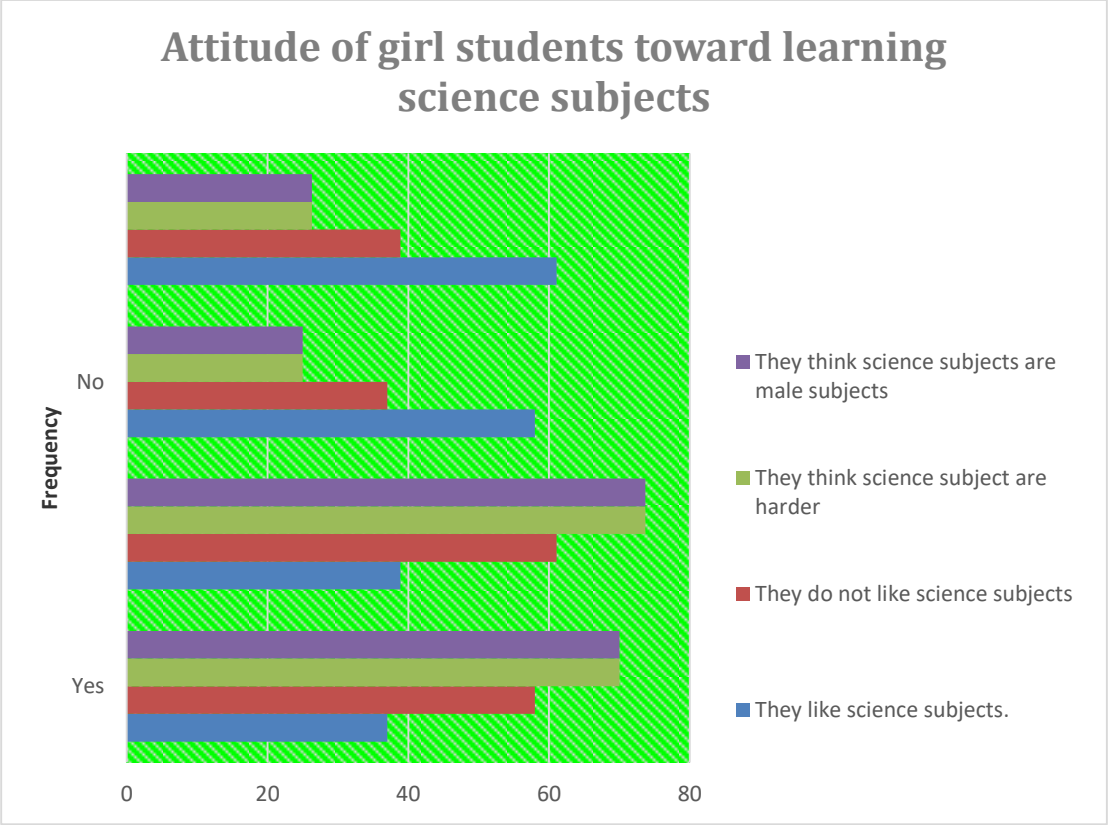


Figure 4.8: Students' Response on the Attitude of Girls towards Learning Science Subjects

Source: Field Data, (2022)

When the researcher asked the girls to freely respond and comment on their attitude toward science in the focus group discussion guides, one of the girls was quoted as saying,

"We are very proud of studying science due to the fact that science has many interesting career paths such as engineering, doctors, nurses, pharmacists, pilots, etc., but some of the science teachers use neglected language, harassment, and over-punishment instead of assisting us. Most of us passed the Form Two Examinations,

*and we occupied a full two classes, but most of us skipped science due to that reason. (*Respondent 1, female, 16 years)*"*

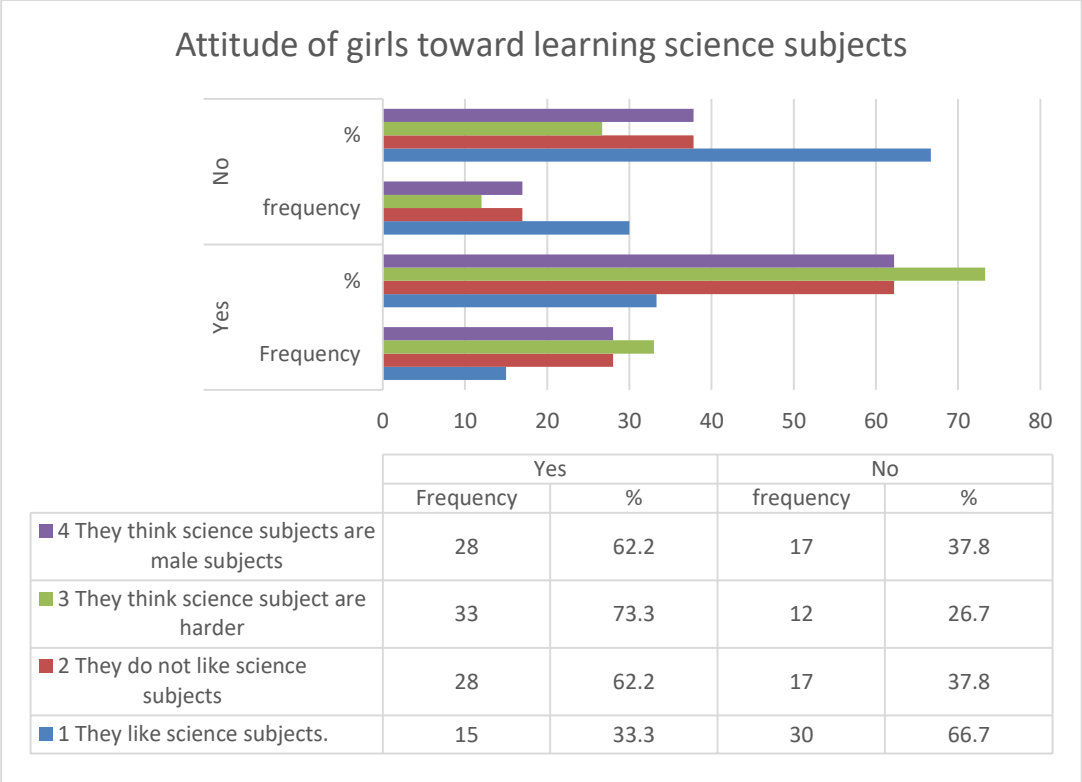
From such a quotation, the researcher argued that most girls have a positive attitude toward science, but they face many obstacles that lead them to change their thoughts and choose to enroll in art-based subjects.

According to the results of the literature reviews, the majority of females have unfavorable attitudes toward learning science courses merely because of the difficulties that they encounter when doing so. For instance, Leary (2006) focuses into the specific ways that peer pressure, a lack of role models, a lack of confidence, a fear of social costs, and cultural influences that discourage girls' interest in the sciences affect their attitudes. According to Gill (1995), depending on individual variations and talents, girls' attitudes about learning science have varied; some are negative and others are positive, particularly in mathematics.

The researcher came to the conclusion that some of the challenges that contribute to girls' unfavorable attitudes toward learning science may be related to the poor instructional practices utilized by the science teachers after observing the results from the field and from the literature reviews.

The study included a total number of 45 teachers who filled the questionnaires about the "Attitude of Girl Students Toward Learning Science Subjects." The findings revealed that 57.8% agreed that girls dislike science subjects because they perceive them to be more difficult and male-oriented, while 42.2% disagreed. This examination led to the realization that most girls have poor mindsets towards

learning science and do not participate as much in science studies simply because of the obstacles they face in learning science, as illustrated in Diagram 12 below.



	Yes		No	
	Frequency	%	frequency	%
4 They think science subjects are male subjects	28	62.2	17	37.8
3 They think science subject are harder	33	73.3	12	26.7
2 They do not like science subjects	28	62.2	17	37.8
1 They like science subjects.	15	33.3	30	66.7

Figure 4.9: Teachers Response on the Attitude of Girl Students on Studying Science Subjects and Other Subjects

Source: Field Data, (2022)

The researcher used an open-ended question in the questionnaires that were filled in by the teachers to let the respondents freely comment by giving out their experiences on the attitudes of girls towards learning science subjects in secondary schools. Among their comments included; female students hate science subjects, they do not opt to take science subjects, they are less confident, they have negative attitudes towards science subjects, they hate the science teachers, they held the wrong

messages that science subjects are for male students, they are lazy and lack seriousness towards science subjects.

When the researcher questioned teachers about the attitudes of girls toward science subjects, teachers provided numerous responses, with one participant being quoted as saying:

> *"Among the challenges I face when teaching my subject which is physics all the years, is the correction and eradication of the attitudes held by the girls and the society in general that science subjects are for male students. I start to educate them that they have such a capability to study science as male students but only few of them agree and understand me while the majority do not agree. They hate me and my subject* (Respondent 3, male 33 years)".

This is a real situation among the students particularly girls, the researcher realized from this quotation that most females appear to have a negative attitude about learning science subjects, which causes a reduction in their interest in those subjects. Most of the female students show different behaviors towards the subjects they dislike in classes including hating the subject teachers and escaping from science classes. The chart below indicates the data from the field displaying the teachers' comments.

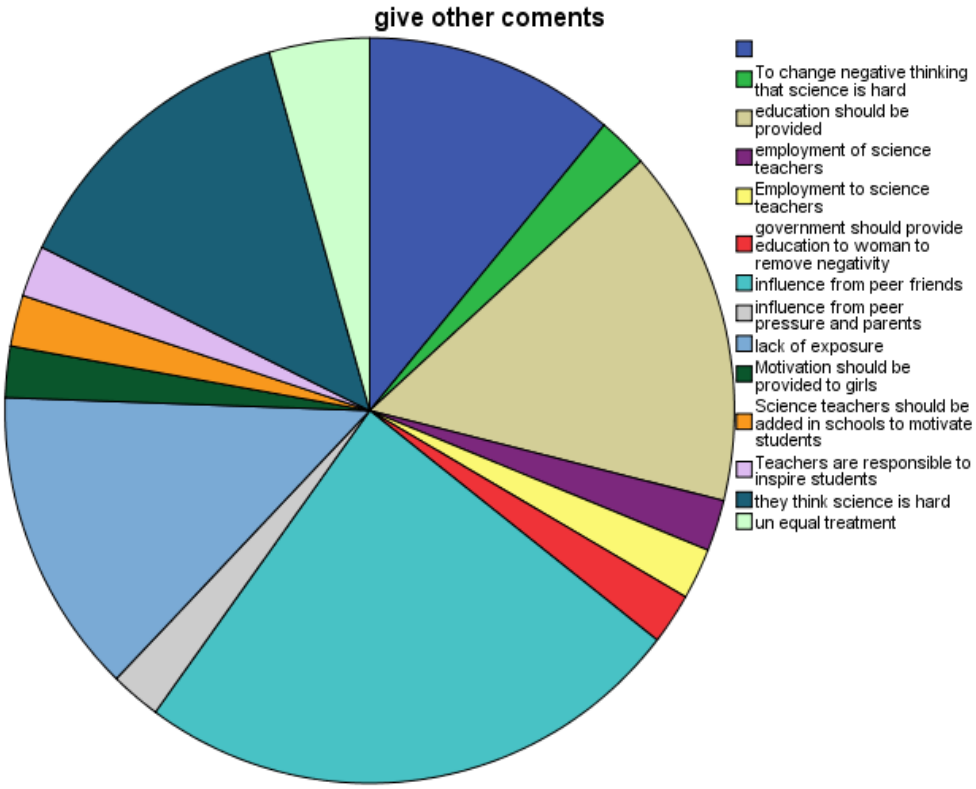


Figure 4.10: Pie Chart Showing Comments on the Attitude of Girls from Teachers

Source: Field Data, (2022)

In an interview, the researcher asked heads of schools to comment on females' attitudes toward learning science subjects. Their responses included the following: the belief that science is for boys demoralizes girls; girls have a negative attitude because science subjects are difficult and the wrong messages they receive from peer friends. The bar chart below displays the comments of the heads of schools from the field.

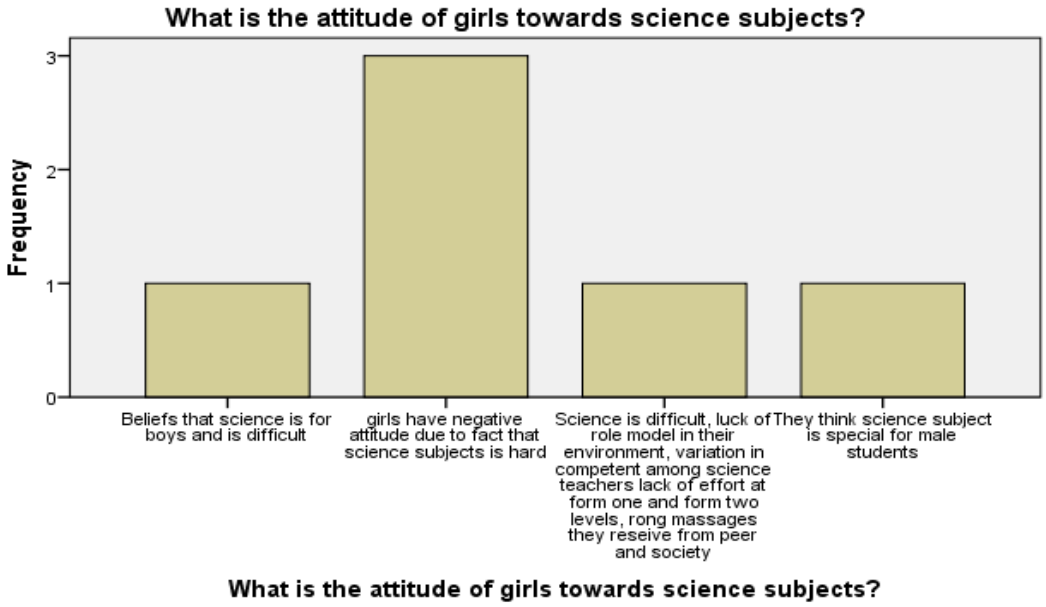


Figure 4.11: Bar Chart Showing Comments from Heads of Schools

Source: Field Data, (2022)

In sum findings of the analysis of girls' attitudes towards learning science subjects, the field data indicate that female students have negative attitudes towards learning science subjects although they vary, they think science subjects are for boys and are difficult, they think science subjects are special for male students, they lack self-confidence, they are lazy, a lack of seriousness towards science subjects, they even tend hate the subjects and the subject teachers, and that they hold wrong messages from their peers.

These data were supported by different literature reviews, among them included Leary (2006) who focuses into the specific ways that peer pressure, a lack of role models, a lack of confidence, a fear of social costs, and cultural influences that discourage girls' interest in the sciences affect their attitudes. Gill (1995), argues that,

depending on individual variations and talents, girls' attitudes about learning science vary; some are negative and others are positive, particularly in mathematics. Ndalichako et al. (2014), adds that successful and influential role models in their communities, the commitment and support of their parents and science subject teachers, the availability of qualified science teachers, and the teaching methods used by those teachers can all influence female students' attitudes toward learning science subjects.

The researcher came to the conclusion that some of the challenges that contribute to girls' unfavorable attitudes toward learning science may be related to the poor instructional practices utilized by the science teachers after observing the results from the field and from the literature reviews. According to the researcher, in order to develop girls' positive attitudes toward learning science subjects, science teachers must improve their instructional techniques, the government must ensure an adequate supply of qualified and motivated science teachers, and parental and community support is also required.

4.2.7 Obstacles Facing Girl Students in Learning Science Subjects

This section includes findings for Objective III, which requires identifying barriers to female students' study of STEM subjects. The researcher used questionnaires as well as interviews to different groups of respondents including; heads of schools, teachers, parents, and students, to study the obstacles that girls face when learning science subjects in secondary school.

Heads of schools: They took part in an interview to share their perspectives on the challenges that girls face when learning science in secondary school. Girls do not believe themselves; they are also not respected; there is a lack of seriousness and encouragement; there is a lack of confidence and self-concept; many of them have a negative attitude; they have heard from others that science subjects are difficult; there is a lack of inspiration; they have experienced sexual harassment on the way to and from school; and there is a lack of guidance and counseling.

Students: The researcher used closed-ended questions in questionnaires distributed to a group of students to obtain responses as illustrated in the figure 4.12 bellow.

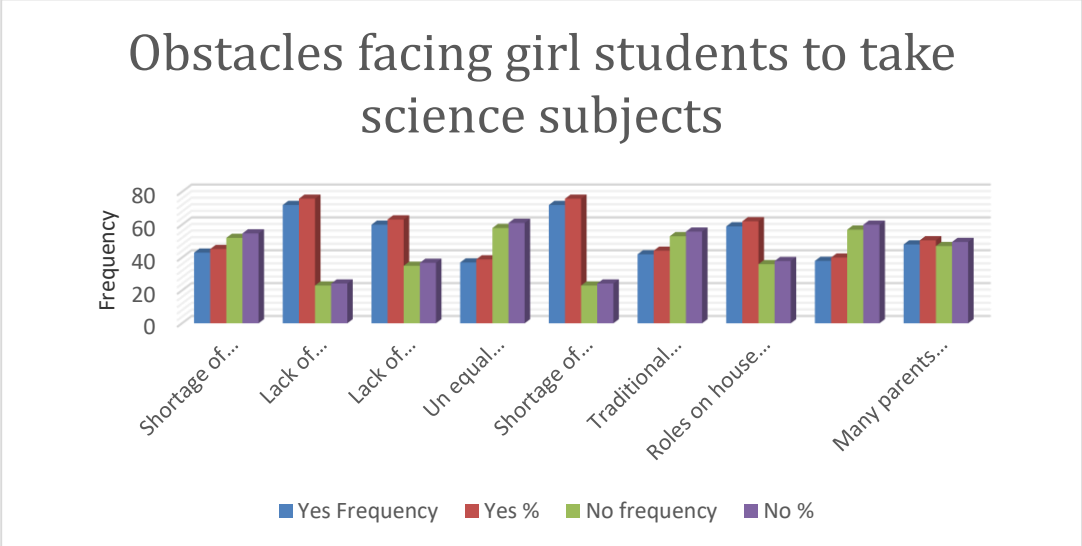


Figure 4.12: Obstacles Facing Girl Students to Take Science

Source: Field Data (2022)

The figure 4.12 above indicates obstacles facing girls to take science subjects.

4.2.7.1 Shortage of Science Books

The field data on the shortage of science books as among the challenges revealed that 54.7% of respondents disagreed. The researcher observed that there were enough science books in all four secondary schools involved in the study in Sumbawanga Municipality, and those books were kept in offices where only teachers and a few students taking science used them, so a lack of books cannot be a reason for a drop in science in secondary schools.

4.2.8 Shortage of Competent Science Teachers

The data from the field indicated that there were shortages of science teachers at all four secondary schools involved in the study. 74% of individuals who responded to the questionnaires agreed with the statement. The lack of science teachers makes students, particularly girls, to avoid science subjects. There was just one physics teacher in each of the two secondary schools, Mafulala and Mazwi, who taught science subjects to all classes form I to IV. Science teachers perceived a violation of their rights because art teachers had only one two periods each day, whereas science teachers had more than seven periods per day. The shortage of science teachers had a direct impact on the failure of female students in science subjects.

4.2.9 Lack of Motivation for Girls Who Take Science

The data from the field revealed that, there is a lack of motivation for girls to study science subjects. The findings showed that 77% of those respondents replied by saying "yes." Motivation as an energizer can be intrinsic or external; the researcher realized that the majority of girls were partially ambitious rather than very ambitious.

4.2.10 Unequal Treatment Between Males and Female Students Who Take Science

The field study findings revealed that, 61% of participants said there was no such barrier and that both girls and boys were treated equally when it came to studying science. The researcher realized that both girls and boys in schools were equally treated hence insisted that unequal treatment cannot be among the barriers for girls towards their preferences, attitudes and performance in science subjects.

4.2.11 Roles on Household and Domestic Chores

The field data showed that 62% of respondents who filled in questionnaires stated that the burden of responsibilities at home influenced most girls negatively. When the DSEO, WEO, and parents were interviewed, they stated, "Day scholar girls perform household work at home, such as washing clothes, fetching water, and cooking food while raising their children."

These activities reinforce gender stereotypes and provide girls less opportunities to study privately than boys. These were linked to other factors such as parental economic status and biological factors; most female students come from lower-income families, and thus their relatives were unable to afford education costs, leaving them without the necessary personal care facilities during the menstrual period. Domestic duties have a negative impact on girls' retention in science subjects and cause them to miss certain classes, which has a negative impact on their academic performance.

Some parents did not believe it was their responsibility to encourage their female students because they considered that teaching girls was a wastage of time and money because they would be married off and their education would benefit only their husbands and families. This had an impact on girls' academic progress because some of them do not obtain parental support and collaboration. One of the respondents was quoted when saying,

> *"Girls have higher capability than boys, but they lack support compared to boys, lack of cooperation, responsibilities, and inspiration from their parents, culture in general, and biological factor facing girls. More than that, the Lack of science teachers in secondary schools leads science teachers to be overloaded and stressed." This situation impact student, particularly girls, who feel that there is no need to study science* (Respondent 4, female 43 years)".

The researcher observed some of the obstacles particularly the shortage of science teachers in the studied schools and reported that the overall average number of science teachers available in four selected schools in 2022 was less than 49% in mathematics and biology, 45% in chemistry, and 33% in physics.

In a nut shell, the investigation on the obstacles facing female students towards learning science subjects indicated that poor science instructional methods, shortage of competent and motivated science teachers, the burden of domestic responsibilities and chores, lack of self confidence among the girls, influence from the peer, lack of motivations among the girls who take science subjects, and other related factors were among the challenges restricting the female students' preferences, attitudes and performance in science subjects.

The data from the field were supported by the evidences from different literature reviews including; URT (2018) who argues that the Tanzanian government has struggled to distribute students' text books in science disciplines in secondary school (Physics, Chemistry, Basic Mathematics, and Biology) at an average of one text per student. This means that science books cannot be among the obstacles hindering female students towards learning science subjects. MOEST Performance Report (2018) argues that a shortage of skilled science teachers in Tanzanian secondary schools was a serious obstacle, causing students, particularly female students, to acquire unfavorable attitudes towards learning science, and so employment for science teachers is still required. Rogers, (2009) adds that challenges such as the persistent lack of specialist science teachers, the way science subjects are taught in secondary schools, and the ongoing fall in the proportion of the school groups that study science subjects are reported. URT (2018) adds that there is inadequate number of scientists and mathematical teachers being recruited for secondary schools in Tanzania, where the total pupil-teacher ratio is still relatively low. McCornick & Pressley (1997) argues that many teachers, parents, and society in general have lower expectations for girls' performance in mathematics and science than they had for boys. This is gradually changing as more girls take on scientific courses and demonstrate their abilities.

Mwamwenda (2004) argues that the level of ambition a girl has determines her motivation to pursue science education in order to reach her full potential. If a girl is moderately ambitious, she will study just enough to pass. Teachers and parents must ensure that girls become intrinsically motivated by implementing the motivation

principle into their education and upbringing. Diamond (2008) adds that the most important factor influencing girls' attitudes about learning science is the quality of the educational experience the teacher provides. The lack of trained scientific teachers who can provide a pleasant learning environment causes them to lose confidence and deliver a less exciting experience.

During the investigation in Sumbawanga Municipal, the researcher discovered a number of barriers that contributed to the drop in science among girls. Three schools lacked libraries and only had one biology laboratory; one school lacked both a library and a laboratory. Poor instructional methods used by science teachers, an insufficient number of competent science teachers, particularly in mathematics, lack of cooperation between teachers and parents, lack of confidence among girls, fear and a negative attitudes that science subjects are difficult and only for men, lack of support from their teachers as well as parents, and lack of significant figures in the society as role models, lack of seriousness and laziness, low parental income to support education costs, a lack of government motivation and influence to support science teachers, the way female students are expected to behave when studying science and mathematics is influenced by their perceptions of gender roles and traits were observed by the researcher as among other obstacles restricting girls towards learning science subjects.

4.3 Mechanisms to Improve Girls' Learning Towards Science Subjects

The findings for objective IV are presented in this section. The researcher wanted to offer measures to improve girls' performance in secondary school science subjects.

The researcher researched methods that can be employed to promote girls' desire to learn science subjects in secondary school using an interview method and a questionnaire. The interview method was used to the respondents from the group of school heads, ward education officers, and district secondary officers who were supposed to respond to the open-ended question in the questionnaires by freely giving out their suggestions on how to improve girls' preferences for science subjects.

The general responses from each group of respondents included the following suggestions: construction of dormitories; employment of competent science teachers; equal treatment between boys and girls in science subjects; encouragement that should start from home to school; debates that should be constructed; emphasis that should be done from the grass roots at the primary level; motivation for those girls who take science; education that should be provided to the stakeholders and community; providing girls with the benefits of studying science; inspiring them with the successful women who opted science; Home activities should be reduced; science subjects should be core and not optional; empowering, encouraging, advising, and influencing girls to take science; eradicating negative beliefs that science is hard and is for male students; and respecting them; eradicating negative beliefs that girls should not break down their values; engaging in positive peer pressure, guiding, and counseling; girls should be serious; there should be equal chances and treatment in science subjects; girls have a high thinking capacity, therefore they should work hard; girls should be given first priority in science; and girls should avoid negative thoughts. Further evidence was illustrated in the figure below:

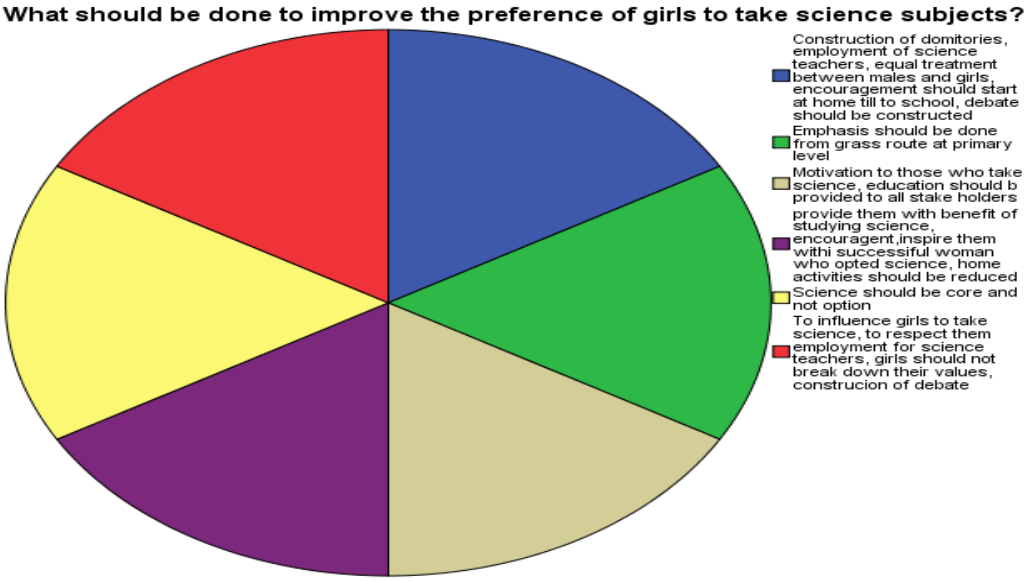


Figure 4.13: Pie Chart Showing Comments on the Mechanism to Improve Girls to Take Science from Heads of Schools

Source: Field Data (2022)

The researcher created some closed-ended questions in the questionnaires that asked different groups of respondents to agree or disagree. Among the questions were the following:

4.3.1 Making Science Subjects Compulsory

The majority of respondents from various groups of students, parents, and teachers who filled in the questionnaires said "yes," with 82% of students, 68.9% of teachers, and 57% of parents agreeing that science should be made compulsory in Tanzanian secondary schools. Based on the findings, the researcher agreed that science subjects should be compulsory, as suggested by the respondents. Making science subjects compulsory for Tanzanian secondary schools could encourage female students' interest in science.

4.3.2 Equal Treatment for both Girls and Boys in Science Subjects

The researcher was interested in whether teachers and parents should treat all students equally. The field data revealed that, 85% of respondents from different groups of teachers, students, and parents believe that parents and teachers must treat all students equally. This could increase females' interest in science in secondary school.

4.3.3 Motivations for Girls Who Take Science

Furthermore, it was in the researcher's aim to determine whether motivation for females who take science could increase their preference for science or not. Teachers and students were both asked to respond "yes or no" to the question. The following graphic summarizes their responses:

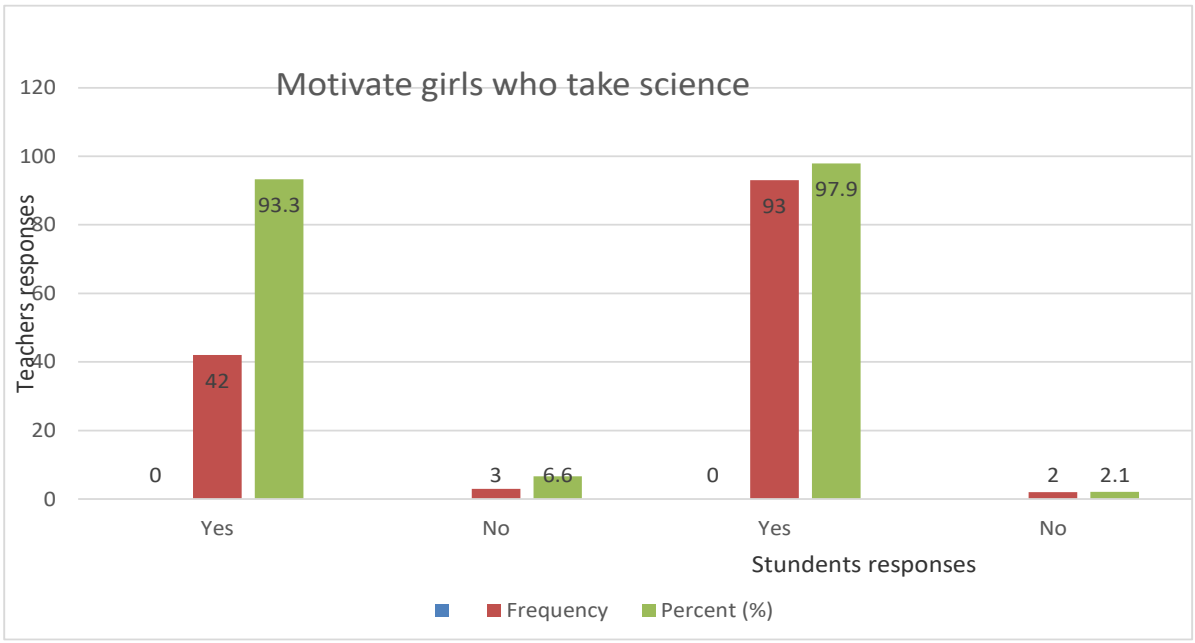


Figure 4.14: Motivation to Girls Who Take Science

Source: Field Data (2022)

The data from the field reveal that, 93 out of 95 students (97.9%) agreed that girls who study science should be motivated, as did 93% of teachers. Based on the information presented above, the researcher realized that motivation is essential in improving girls' attitudes toward learning science subjects in secondary schools. In addition, 74% of parents asked believed that girls who study science should be motivated in order to inspire others who have a negative attitude.

4.3.4 Abolition of Traditional Beliefs and Customs Which Hinder Girls in Science Subjects

The researcher asked if removing traditional beliefs and norms that prevent girls from participating in science-related subjects might boost their preference for science. The field data revealed that all the respondents from different groups agreed that eliminating any traditional beliefs and practices that limit females' participation in education will improve their choice of science subjects. Furthermore, many instructors and parents continue to have lower expectations and views about females' math and science success when compared to the success of boys.

4.3.5 Creation of Conducive Learning Environments

The researcher wanted to determine whether creating favorable learning environments may boost females' preferences for science or not. The field data showed that, 100% of teachers who were questioned through questionnaire responded by saying "yes," and 97.9% of students also said “yes” when responding

to the same question. The study found that creating appropriate and conducive learning conditions, such as establishing hostels to keep females safe at school, is critical to encouraging a significant number of girls to take science topics.

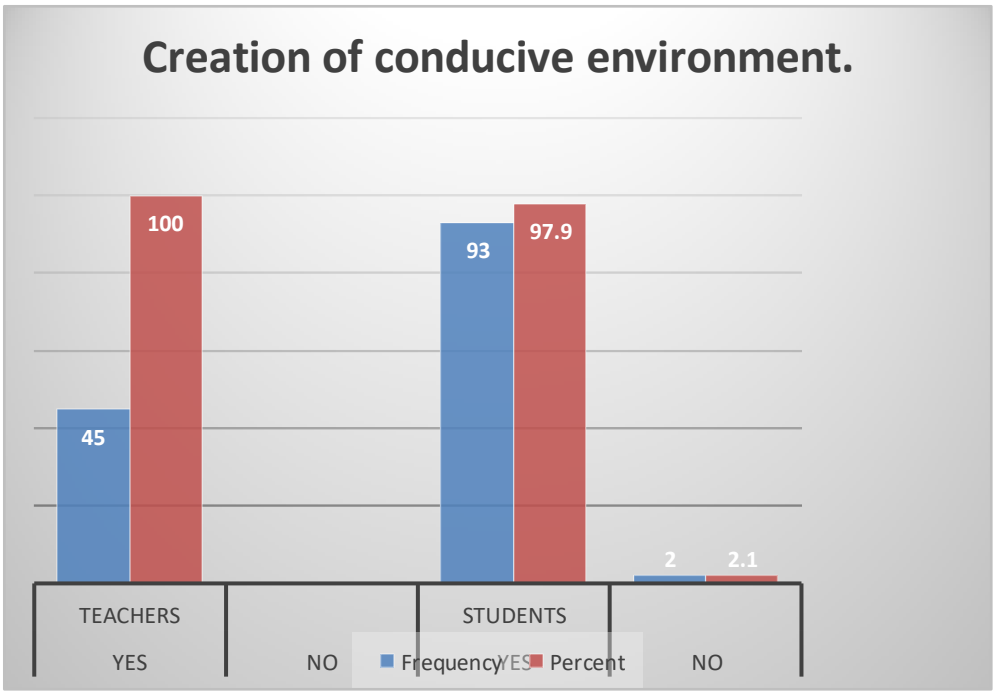


Figure 4.15: Creating Conducive Environment

Source: Field Data (2022)

4.3.6 Availability of Teaching And Learning Facilities

The field data on the availability of teaching and learning facilities show that 100% of teachers and 97.9% of students who responded to a questionnaire said that the availability of teaching and learning resources is essential for improving girls' preference for science subjects, and that their responses indicated that the availability of plenty of teaching and learning materials could enable them to improve their preference for science as illustrated in the figure below.

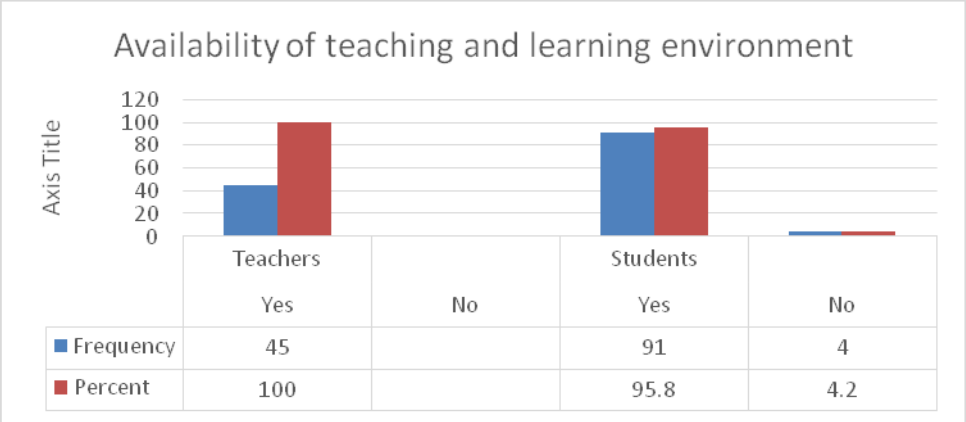


Figure 4.16: Availability of Teaching and Learning Resources

Source: Field data, (2022)

4.3.7 Building Positive Attitudes Towards Science Subjects

The field data on the creation of positive attitudes towards science subjects showed that 96.8% of the students who were asked this type of topic believed that encouraging girls to value science subjects could motivate them to pursue them. Their responses were in line with the behavioral learning theory that, changing girls' attitudes toward science subjects might help them improve their preference for studying science in secondary schools.

4.3.8 Encouraging Girls to Study Science Subjects

The researcher investigated whether by encouraging female students would boost their interests in science subjects. Approximately 74% agreed the statement. This shows that parents believe that females should be encouraged to study science subjects in secondary school to increase their interest in science. The chart below indicates the data from the field.

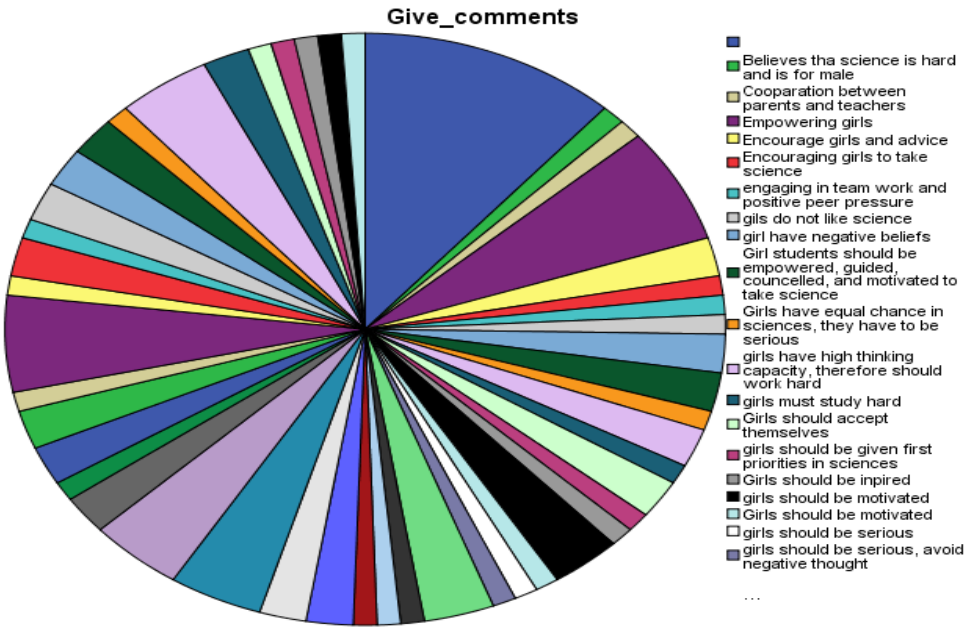


Figure 4.17: Pie Chart Showing Comments on the Mechanism from Students

Source: Field Data (2022)

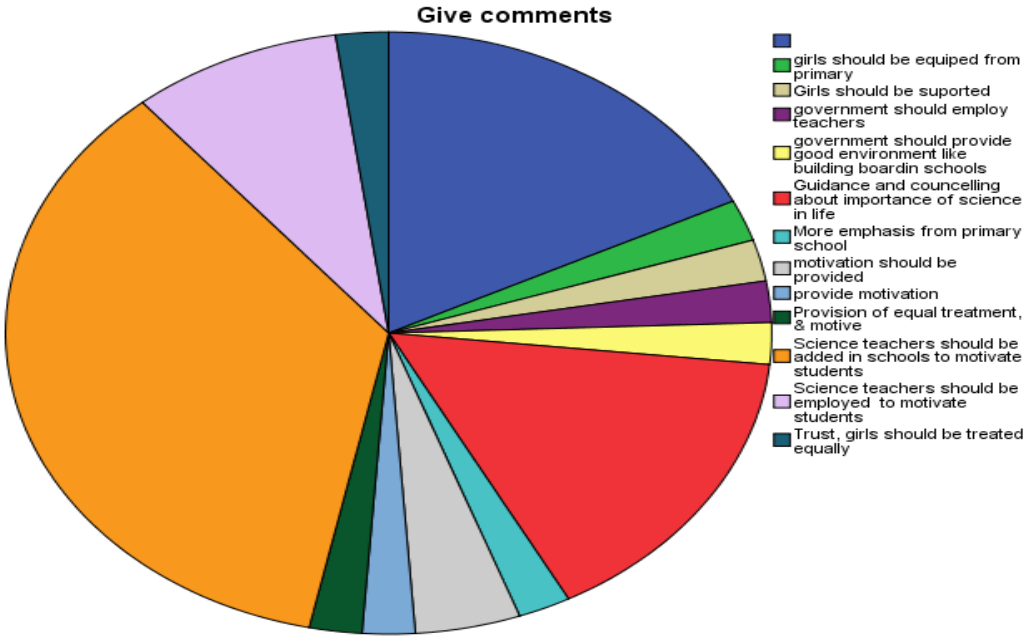


Figure 4.18: Pie Chart Showing Comments on the Mechanism from Teachers

Source: Field Data (2022)

In sum findings of the mechanisms and strategies that can be used to improve the girls' preference, attitudes and performance in science subjects insist that the most powerful strategies included availability of teaching or learning equipment and presence of a conducive surroundings; these strategies work interchangeably. Creating a conducive environment includes the presence of adequate number of competent science teachers, attractive important buildings and furniture, as well as teaching/learning resources, including enough laboratory kits and apparatus.

Evidences from literature reviews showed various strategies supporting the field data for example (Mwamwenda, 2004) argues that motivation is an energizer or driving inner force that can motivate an individual to engage in particular actions in order to meet their requirements. This might be utilized to ensure that learners, particularly female students, pay greater attention to learning science courses, despite the fact that not all of them are motivated to learn. The task of science teachers and parents is to create ways and means of getting girl students to attend and respond to learning tasks so that learning becomes a source of motivation in and of itself.

Parents and teachers are concerned with helping girls to change their negative attitudes and beliefs that science subjects are difficult in order for them to reach their full potential. As a result, if we want to develop a good scientist girl who can think critically, we must first understand academic motivation and then find innovative ways of changing schooling to increase rather than destroying academic motivation, as (Mwamwenda, 2004) suggests. Girls may blame their failure on unchanging abilities, insufficient effort, or excessive task difficulty. This mindset is influenced

by society's low expectations on girls as well as the clear assignment of "proper" roles. This perception is rapidly changing as more girls take on science studies and prove their full competence (Mwamwenda, 2004).

Teachers report that female students encounter several challenges at home, including the following: women have less time to study and look for resources outside of their homes than males, they are overburdened with home and society obligations, and they endure harassment on their route to and from school. This has contributed to a negative attitude toward science education. The community and the government should construct dormitories to provide more opportunities for girls to study as suggested by Melack (2014).

Tanzania's government is working hard to improve the learning environment by providing learning facilities, establishing classrooms, and disbursing Capitation Grants in secondary schools to equip learners, particularly girls, to study science subjects (URT, 2018). The behavioral theory of learning is based on a stimulus-and-response model, which argues that associations between a stimulus and the response to it, as well as the presence of reinforcement, form the basis of learning (Omari, 2006). Science teachers should form strong relationships with female students in order to help them create a positive mindset toward the school curriculum, increasing their chances of passing science courses (Zanden & Pace, 1984).

The researcher observed that if we want to improve the girls' attitudes, preference and performance in science subjects, the first thing to do is to change their mindset on the notion that science subjects are hard and male-oriented subjects. The

community should be educated that all students regardless of their gender and sex have equal capabilities to study all kinds of subjects including science subjects. The researcher finally concluded that without having adequate number of competent and motivated science teachers, there will be no improvement in girls' preference, attitudes and performance in science subjects even if there are improvements in infrastructures and teaching resources.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings, conclusions, recommendations, and proposals for future research on school girls' attitudes about learning science. This study would like to make some recommendations based on its findings.

5.2 Summary of Study

Although students' attitudes towards learning science subjects vary, it was discovered that most girls prefer to take other subjects, such as arts, over science because most respondents stated that few girls prefer to take science compared to many participants who stated that the girls' attitude is to take other subjects.

It was surprising to discover that most girls believe science subjects are more difficult and male-oriented, and hence they are unable to study. Only a few participants stated that girls enjoy science, but the majority stated that girls have negative attitudes about learning science subjects.

The researcher discovered several obstacles that hinder girls' preference to take science subjects, which included: shortage of science teachers in secondary schools; lack of seriousness; negative thinking that science is hard; absence of dormitories; lack of inspiration from significant others in their surroundings; lack of support from their parents and teachers; bad instructional methods of teaching and learning in the classroom; low teachers’ morale; abusive language and neglect from their science teachers; roles on housekeeping and domestic chores; lack of motivation; bad

messages they receive from society and peer friends that science is hard; lack of guidance and encouragement; lack of guidance and encouragement; lack of laboratories; and economic status of parents. These obstacles lead most of the girls to dislike taking science subjects.

Furthermore, the researcher discovered that, several measures must be taken in order to improve girls' attitudes and increase their preference for science subjects, such as improving the classroom teaching and learning environment by ensuring that there are sufficient number of motivated science teachers, science laboratories, hiring or increasing the number of science teachers in secondary schools, cancelling or guidance and encouraging girls to remove negative thinking that science is difficult, building dormitories so that a girl student can escape some contradictions they face at home such as housekeeping and home chores, girls should be supported and motivated to prefer science subjects, teacher should use good instructional method of teaching and learning to assist students instead of using neglecting language, girl students should be motivated and inspired to work hard as well as the need to make science subjects compulsory subject to all students.

5.3 Conclusions

Understanding girls' attitudes about science subjects is a crucial step toward resolving the issue of low engagement in science and mathematics. The researcher reaches the following conclusions based on these findings:

Female students' interest in learning science subjects is largely influenced by personal variables. A shortage of competent science teachers, teaching and learning

instructional approaches, the financial status of parents, the absence of dormitories, laboratories, and scientific teaching and learning resources in schools, the language treatment used by some science teachers, affect and demoralized girls' decisions in selecting science subjects, these factors play an essential role in developing and maintaining students' innate desire to learn science subjects

5.4 Recommendations

Based on the above conclusions, the researcher thought it was reasonable to make the following recommendations:

5.4.1 Recommendations for Policy and Practice

The discussion discovered that a number of factors, such as personal variables, school characteristics, socioeconomic variables, and political policy variables, influence students' select of science disciplines in secondary school, with female students being more affected. As a result, the Ministry of Education and Vocational Training should make measures to improve the performance of secondary students, particularly females, in science and mathematics. This is because the majority of female students were impacted by their own views, interests, and attitudes about science. As a result, there is a need to develop the teaching and learning surroundings at school by ensuring secondary schools have enough qualified science and mathematics teachers to remove these misconceptions, as well as by building enough science laboratories, libraries, and dormitories to accommodate female students to achieve goals safely while at school.

Dropping out of science is a serious problem for a female student; thus, special attention should be paid to female students' performance and participation in science and mathematics by ensuring that all girl students who passed the Form Two National Examination in science subjects are provided with special motivation from the government to encourage them to continue with science streams.

The heads of secondary schools should pay more attention to making follow-up on the instructional methods of teaching and learning used by some science teachers because the findings show that some science teachers were the source of the drop in science studies among students, especially girls. More than that heads of schools and science teachers can initiate extra-curricular activities such as the provision of debate that brings teachers and students together to discuss issues related to science studies that link with higher education and career development.

Secondary school heads should pay more attention to the instructional methods of teaching and learning employed by some science teachers, because the data indicate that some science teachers are the cause of a decline in science studies among students, particularly girls. Furthermore, school heads and science teachers can organize extracurricular events such as debates that bring together teachers and students to discuss issues relating to science studies that link to further education and career development. The ministry of education should rescue what is missing from the curriculum for the preparation of teachers in colleges and universities because a variation in moral aspects, ethics, and skills is a serious problem for science teachers in secondary schools.

Curriculum developers should develop well-designed and initiate strategies to rescue the situations and solve the problem.

Policymakers should develop policies that encourage girls to study science subjects in the country, mostly in secondary schools.

Variation in distributing government secondary school teachers by regions is a serious problem; the government needs to put more effort into distributing teachers more equally among the regions and councils.

5.4.2 Recommendations for Further Researches

The study concludes by suggesting areas which can be further researched on the girl's preference in learning science subjects.

Follow-up on the way science teachers are trained should be done, and their practice at the school level after the completion of their training and the way they assist girl students should be investigated.

More studies concerning successfully graduated girl students who passed science at Form II, Form IV, and VI should be done to determine their career development.

The influence of successful women in science (role models) is an area to be researched.

Family socioeconomic status and students' choices of science subjects can also be researched.

The impact of the provision of special motivation for competent science teachers in secondary schools

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APPENDICES

APPENDIX I: QUESTIONNAIRES FOR STUDENTS

ATTITUDE OF GIRLS TOWARD LEARNING SCIENCE SUBJECTS IN SECONDARY SCHOOLS THE CASE OF SUMBAWANGA MUNICIPAL

Instructions

This questionnaire contains items that are related to the attitude of girls toward learning science subjects in secondary schools. I would like to know more about your decisions to join science streams; therefore, you are requested to fill it. The data provided will be used for research purposes only and will be kept confidential. Please be honest.

PART I

PERSONAL INFORMATION

Kindly fill out your personal information.

1. Sex
    a) Male…
    b) Female…
2. Age
    a) 11-15…
    b) 16-20…
    c) More than 21…
3. Class
    a) Form I…
    b) Form II…

c) Form III…

d) Form IV…, e) Form V…, f) Form VI…

4. What subjects do you prefer?

a) Arts…

b) Science…

c) Business…

PART II

QUESTIONS:

5. Do you know if science subjects are taught in secondary schools?

a) Yes…….b) No…….

If yes, please proceed to the following questions by ticking the correct response.

6. What is the preference of girl students between science and other subjects?

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1.	Most girls prefer to take science over other subjects.					
2	Some girls prefer science to other subjects.					
3	Most girls do not like to take science subjects.					
4	Girls do prefer other subjects than science.					

7. What is the attitude of girl students toward learning science subjects?

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1.	They like science studies.					
2.	They do not like science					

	studies.					
3.	They think science subjects are harder.					
4.	They think science subjects are male subjects.					

8. What obstacles face girl students in learning science subjects?

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1.	Shortage of books.					
2.	Lack of motivation.					
3.	Lack of seriousness.					
4	Un equal treatment between male and female students taking science.					
5	Shortage of competent science teachers.					
6	Traditional beliefs, culture, and practice					
7	Roles in house keeping and domestic chores.					
8	Hard physical experiments and practice are involved in the sciences.					
9	Many parents and members of the community think that educating girls is waste of time.					

9. What mechanisms can help girls perform better in science subjects?

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Disagree
1	Science should be a compulsory subject for all students.					
2	Teachers and parents must treat all science students equally.					
3	Motivate girls who take science subjects.					
4	Traditional beliefs and practices that hinder girls participation in education should be abolished.					
5	Create a conducive environment					

	that is attractive and suitable for learning or teaching					
6	Availability of teaching and learning resources					
7	Building a high self-concept and positive attitude among girls toward science subjects					

10. Give any other comments on the way you perceive it is related to girls attitudes toward learning science subjects in secondary schools…….....

……

APPENDIX II: QUESTIONNAIRE FOR TEACHERS

This questionnaire contains items that are related to your perceptions of the attitude of girl students toward learning science subjects in secondary schools in Sumbawanga Municipal. I would like to know more about the attitudes of girls toward learning science subjects, their preferences, and the obstacles that hinder them from studying science subjects. Your responses will be kept confidential. Please be honest.

PART I:

PERSONAL INFORMATION

Kindly fill in your personal information by ticking the box provided.

1. **Sex**
   i) Male
   ii) Female
2. Age …
3. Teaching subjects
   i) Arts …
   ii) Science …
   iii) Business …
4. Which class are you teaching?
   i) Form I…
   ii) Form II…
   iii) Form III…
   iv) Form IV., V. Form V., VI. Form VI.

PART II

QUESTIONS

5. Do you know if science subjects are taught in secondary schools?

a)Yes…….b) No…….

If yes, please proceed to the following questions by ticking the correct response.

6. What is the preference of girl students between science and other subjects?

i) What is the preference of girl students between science and other subjects?

		Strongly disagree	Disagree	Not Sure	Agree	Strongly Agree
1.	Most girls prefer to take science over other subjects.					
2.	Some girls prefer science subjects to other subjects.					
3	Most girls do not like to take science subjects.					
4	Girls do prefer other subjects than science.					

ii) Other comments specify:……

7. What is the attitude of girl students toward learning science subjects?

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
i	They like science.					
ii	They do not like science studies.					
iii	They think science subjects are harder.					
iv	They think science subjects are male subjects.					

v) Other comments specify

……

…….

8. What obstacles face girl students in learning science subjects?

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
i	Shortage of books					
ii	Lack of motivation					
iii	Lack of seriousness					
iv	Uneven treatment between male and female students taking science subjects.					
v	Shortage of science teachers.					
vi	Hard physical experiments and practice are involved in science.					

vii) Other comments (specify)

……

9. What mechanisms can help girls perform better in science subjects?

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
i	Science should be a compulsory subject for all students.					
ii	Teachers and parents must treat all science students equally.					
iii	Motivate girls who are taking science subjects.					
iv	Preparation of an attractive and conducive environment for science subjects.					

vi) Other comments specify

……

APPENDIX III: QUESTIONNAIRE FOR PARENTS

This questionnaire contains items that are related to your perceptions of the attitude of girl students toward learning science subjects in secondary schools in Sumbawanga Municipal. I would like to know more about the attitudes of girls toward learning science subjects, their preferences, and obstacles that hinder them from studying science subjects. Your responses will be kept confidential. Please be honest.

PART I:

PERSONAL INFORMATION

Kindly fill in your personal information by ticking the answer provided.

1 Sex

(i) Male……..

(ii)Female ……

2 Age …

(i) 25-30……., (ii) 31-45…., (iii) 46-55……., (iv) above 55 …….

3. Which Street do you live on ? ……

4. Occupation

(i) Peasant…….

(ii) Busnes…….

(iii) Teacher…….

(iv)Other occupation……

5. Education level

i) I didn't go to school …….

ii) Standard seven…

iii) Form four….

iv) Form six ….

v) Certificate ….

vi) Diploma …., Degree …., Masters ….., PhD….

PART II

QUESTIONS

6. Do you know if science subjects are taught in secondary schools?

a)Yes…….b) No…….

If yes, please proceed to the following questions by ticking the correct response.

7. What is the preference of girl students between science and other subjects?

		Strongly disagree	Disagree	Not Sure	Agree	Strongly Agree
1.	Most girls prefer to take science over other subject.					
2.	Some girls prefer science subjects to other subjects.					
3	Most girls do not like to take science subjects.					
4	Girls do prefer other subjects than science.					

Other comments specify ……..

8. What is the attitude of girl students toward learning science subjects?

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
i	They like science.					
ii	They do not like science studies.					
iii	They think science subjects are harder.					
iv	They think science subjects are male subjects.					

iv) Other comments specify

……

9. What challenges face girl students in learning science subjects?

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
i	Shortage of books.					
ii	Lack of motivation.					
iii	Lack of seriousness.					
iv	Uneven treatment between male and female students taking science subjects.					
v	Shortage of science teachers.					
vi	Hard physical experiments and practice are involved in science.					

vii) Other comments (specify)

……

10. What mechanisms can help girls perform better in science subjects?

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
i	Science should be a compulsory subject for all students.					
ii	Teachers and parents must treat all science students equally.					
iii	Motivate girls who are taking science subjects.					
iv	Preparation of an attractive and conducive environment for science subjects.					

vii) Other comments specify

……

…….....

.....

APPENDIX IV: DODOSO ZA WAZAZI

Dodoso hizi zinalenga kufahamu mtizamo wa wanafunzi wa kike wasomao sekondari kuhusu masomo ya sayansi. Utafiti huu ni wa kitaaluma na majibu yatakayopatikana yatatumiwa kitaaluma na si vinginevyo. Unaombwa kujibu maswali yote kwa ufasaha kadiri ya ufahamu wako, na majibu yako yatabaki kuwa siri ya utafiti huu pekee. Tafadhari weka alama ya vema kwenye nafasi uliyopewa au andika jibu la ziada kwenye na fasi wazi.

Taarifa Binafsi

1. Jinsia

    i) Kike…

    ii) Kiume…

2. Umri wako (i) 25-30…., (ii) 31-45…., (iii) 46-55..., 56 na kuendelea….

3. Unaishi mtaa wa……..

4. Unafanya kazi ya;

    (i) Mkulima….

    (ii) Mfanya biashara….

    (iii) Mwalimu…..

    (iv) Mfanyakazi mwingine….

5. Kiwango cha elimuyako;

        (i) Sikwenda shule kabisa….

        (ii) Darasa la saba…..

        (iii) Kidato cha nne….

        (iv) Kidato cha sita ….

(v) Setifikate …

(vi) Diploma …., Digrii …., Mastazi ….., PhD

6 Una mtoto asomaye sekondari?

i) Ndiyo……

ii) Hapana….

Kama jibu lako ni ndio, endelea kujibu maswali kwenye jedwali lifuatalo kwa kutiki sentensi unazo fikiri ni sahihi katika sehemu husika;

7. Ni somo gani kati ya masomo ya sayansi na masomo ya sanaa wasichana hupendelea kusoma?

S/N		Sikubali kabisa	Sikubali	Sijui	Nakubali	Nakubali Kabisa
1	Wasichana wengi hupenda kusoma sayansi kuliko masomo mengine					
2	Wasichana wachache hupenda kusoma sayansi kuliko masomo mengine.					
3	Wasichana wanapenda masomo mengine kuliko sayansi					
4	Wasichana wengi hawapendi kusoma masomo ya sayansi.					

Toa maoni yako kuhusu upendeleo wa wanafunzi wa kike kusoma masomo ya sayansi au masomo ya sanaa .....

8. Ni mtizamo gani walionao wanafunzi wa kike kuhusu masomo ya saysnsi?

Wasichana wanapenda sayansi					
Wasichana hawapendi sayansi					
Wasichana wanaona masomo ya sayansi ni magumu					
Wasichana wanaona masomo ya sayansi ni ya wavulana					

Toa maoni yako kuhusu mtazamo wa wanafunzi wa kike kusoma masomo ya sayansi.....

……

9. Ni vikwazo gani wasichana wanakutana navyo katika kusoma masomo ya sayansi?

Upungufu wa vifaa vya kufundishia sayansi hukatisha tamaa wasichana.					
Uduni wa motisha husababisha wasichana kutosoma sayansi					
Kuwajali zaidi wavulana kuliko wasichana katika somo la sayansi husababisha wasichana wasilipende somo hilo.					
Upungufu wa walimu wa sayansi husababisha wasichana wengi kutolipenda somo hilo.					
Mazoezi magumu kwa masomo ya sayansi ni kikwazo kwa wasichana.					

Toa maoni yako mengine kuhusu vikwazo vinavyowakwamisha wanafunzi wa kike kusoma masomo ya sayansi ……..
……

10. Mbinu gani zitumike ili kuwafanya wanafunzi wa kike kufanya vizuri katika masomo ya sayansi.

Masomo ya sayansi yawe ya lazima kwa wanafunzi wote					
Wanafunzi wote wasomao wapewe haki sawa bila kujali jinsia zao					
Wanafunzi wa kike wapewe motisha ili wapende kusoma sayansi					
Wazazi na walimu wawahimize watoto wao kupenda kusoma sayansi					

Toa maoni yako mengine ……..

…….

APPENDIX V: INTERVIEW GUIDE FOR HEAD OF SCHOOL AND WARD EDUCATION COORDINATOR

Attitude of girls toward learning science subjects in secondary schools: the case of Sumbawanga Municipal

This interview guide contains questions that are related to your perceptions of the attitude of female students toward learning science subjects in secondary schools in Sumbawanga Municipal. I would like to know more about the attitudes of girls toward learning science subjects, their preferences, and the obstacles that hinder them from studying science subjects. Your answers will be kept confidential. Please be hones t.

PART I:

PERSONAL INFORMATION

Kindly fill out your personal information.

10. Sex

iii) Male

iv) Female

11. Age ……..

12. Teaching subject

v) Arts ……

vi) Science ……

vii) Business ……

13. Which class are you teaching?

    viii) Form I…

    ix) Form II….

    x) Form III…

    xi) Form IV…

1. Are science subjects taught in your secondary school?
2. Who prefers more science subjects among male and female students?
3. What is the attitude of girls towards science subjects?
4. What obstacles face girls who want to take science subjects?
5. What should be done to improve the preference of girls for science subjects?

APPENDIX VI: FGD GUIDE

i. Why most of girls perform poorly in science subjects in secondary schools in Tanzania?

ii. How do social economic factors affect girl students to take science subjects?

iii. What mechanism should be done to improve science education in secondary schools?

APPENDIX VII: DECLARATION OF CONFIDENTIALITY

THE OPEN UNIVERSITY OF TANZANIA

DIRECTORATE OF RESEARCH, PUBLICATIONS AND POSTGRADUATE STUDIES

P.O. Box 23409,
Dar es Salaam, Tanzania
http://www.out.ac.tz

Tel: 255-22-2668992; E-mail: drpc@out.ac.tz

DECLARATION OF CONFIDENTIALITY

To: The Chief Executive Officer of Sumbawanga Municipal Council. I, Kayanda Francisca, PG201609145, of the Department of Education, Faculty of Education, Open University of Tanzania, declare that, I will maintain secrecy and confidentiality, and will not use any data and information obtained from your organization in the course of my research for any purpose other than for my academic endeavors.

Signature: F. Kayanda (Student)

Date:20/07/2021.

Countersigned by:

Name: Dr. Adam Namamba (Supervisor)

Signature: 

Supervisor

Date: 20/07/2022

APPENDIX VIII: RESEARCH CLEARANCE LETTER

THE OPEN UNIVERSITY OF TANZANIA

DIRECTORATE OF POSTGRADUATE STUDIES

P.O. Box 23409
Dar es Salaam, Tanzania
http://www.out.ac.tz

Tel: 255-22-2668992/2668445
ext.2101
Fax: 255-22-2668759
E-mail: dpgs@out.ac.tz

Our Ref: PG201609145

22nd February 2022

Municipal Director,

Sumbawanga Municipality,

P.O Box 187,

RUKWA.

RE: RESEARCH CLEARANCE

The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1st January 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Ms. KAYANDA Francisca, Reg No: PG201609145** pursuing **Master in Education in Admintration, Planning, and Policy Studies (MED APPS).** We here by grant this clearance to conduct a research titled **"Attitude of Girls Toward Learning Science Subject in Secondary School in Tanzania".** She will collect her data at your area from 28th February 2022 to 05th April 2022.

In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam.Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours,
THE OPEN UNIVERSITY OF TANZANIA

Prof. Magreth S.Bushesha
DIRECTOR OF POSTGRADUATE STUDIES.

APPENDIX IX: ACCEPTANCE LETTER

SUMBAWANGA MUNICIPAL COUNCIL

Phone No. +255 25 2802163
Fax No. +255 25 2802163

Email: md@sumbawangamc.go.tz
Website: www.sumbawangamc.go.tz

P.O. BOX 187,

SUMBAWANGA

Ref. No. SMC/E.30/15/06/146

03 February,2022

Director of Postgraduate Studies,
The Open University of Tanzania,
P. O. Box 23409,
DAR-ES-SALAAM.

REF: ACCEPTANCE FOR DATA COLLECTION AND RESEARCH WORK AT KIZWITE , MAZWI, MAFULALA AND KILIMANI MAWENI SECONDARY SCHOOLS.

Reference is hereby made to the letter with Ref. NO. PG201609145 of 22nd February,2022 requested for data collection and research work entitled "Attitude of Girls Toward Learning Science Subject in Secondary School in Tanzania " from 28TH February 2022 to 05th April 2022.

With this letter, the Director of Sumbawanga Municipal Council has agreed to allow MS Kayanda Francisca Reg No. PG201609145 pursuing Master in Education in Administration, Planning and Policy Studied (MED APPS) to conduct her research at Kizwite , Mazwi, Mafulala and Kilimani Maweni Secondary Schools.

The Office expects that the Student findings could help our organization to grow as well as the Nation.

I remain,

Andrew S Zumba
FOR: MUNICIPAL DIRECTOR
SUMBAWANGA.

MUNICIPAL DIRECTOR
SUMBAWANGA MUNICIPAL COUNCIL

Copy to:

1. HOD of Secondary Education - For information
2. Headmaster of Mazwi Sec - Assist her.
3. Head Master of Kizwite Sec - Assist her
4. Headmistress of Kilimani Maweni - Assist her
5. Headmaster of Mafulala Sec. - Assist her
6. Ms Kayanda Francisca - For information